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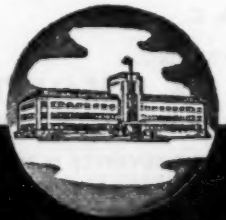

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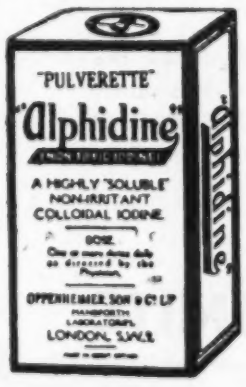

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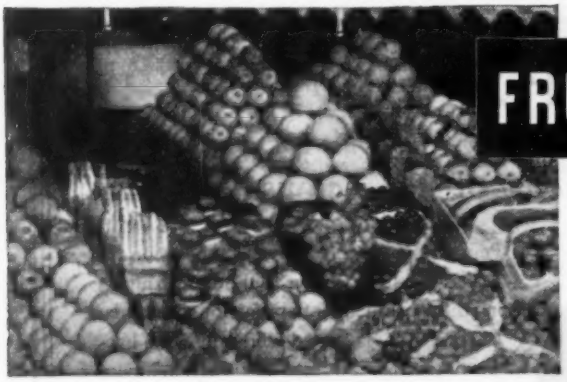

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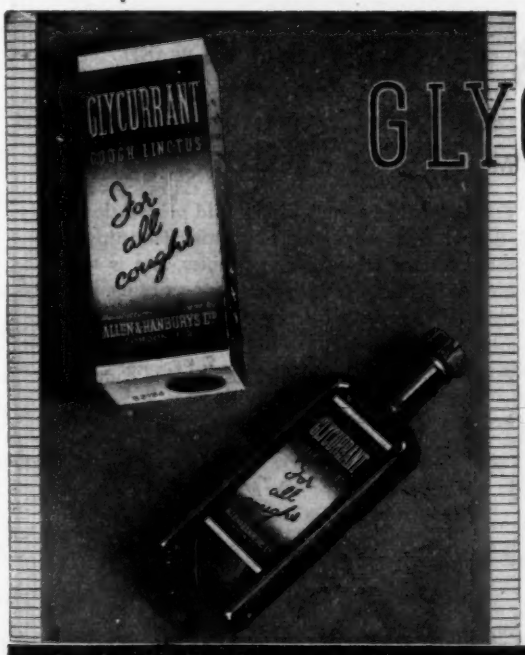

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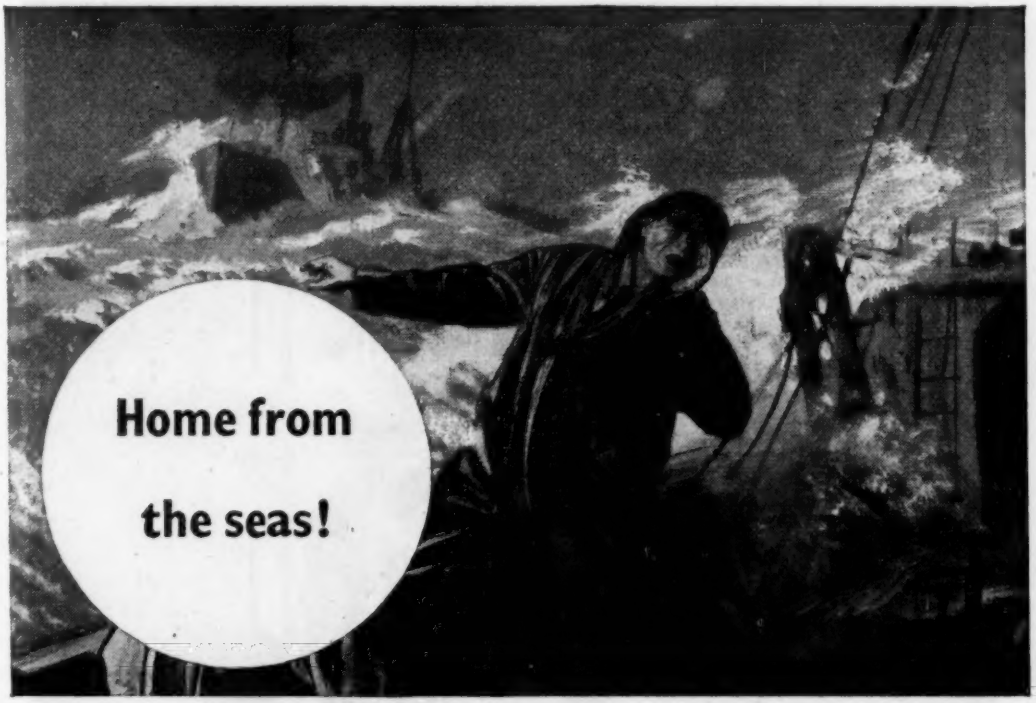

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The treatment of SCABIES

with the new non-irritant sarcopticide

SAREVAN

EVANS
SAREVAN
A lotion containing 2 per cent. ROTENONE for the treatment of scabies and dermatosis of parasitic origin
DIRECTIONS
First Night. Bathe with hot water and soap, rinsing well and scrub. Dry and rub lotion well in face and scalp. Rub the rest all over the body.
Next Morning. Rub the lotion in again, without bathing. Wear the same underwear.
Second Night. Rub the lotion in a third time, without bathing.
Next Morning. Rub the lotion in a fourth time, without bathing.
Next Night. Bathe thoroughly and put on fresh underwear. Soiled underclothes and bed linen should be boiled for 20 minutes in "Evans" one tablespoonful to half gallon of water.
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Evans Sons Lescher & Webb
Liverpool and London
SAREVAN

COMPOSITION. A 2 per cent. non-oily emulsion of rotenone. (Rotenone is non-toxic, non-irritant, and is not absorbed from topical applications.)

INDICATIONS. For the treatment of scabies and other dermatoses of parasitic origin.

ADMINISTRATION. Sarevan is applied to the affected areas after a thorough cleansing with soap and hot water. For full directions see literature.

FEATURES.

1. Non-irritant.
2. Does not stain bed linen or underwear and the patient is not conscious of its presence.
3. The base acts as an emollient to the irritation and dermatitis often found in severe scabies; immediate relief is obtained.
4. Well tolerated by sensitive skins.
5. One ounce of lotion is sufficient for one application to the entire body.

PACKAGES. Bottles of 4 and 20 fl. oz.

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The occurrence of dermatitis following the application of various agents used in the treatment of scabies, including rotenone preparations, has been observed in a small percentage of sensitive individuals. Precautions should therefore be taken, by careful observation, to avoid the continued application of Sarevan, where such untoward occurrences appear to be developing.

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Literature on application

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(HEWLETT'S)

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Dose : 1 to 2 drachms diluted.
In 22, 40, and 90 oz. Bottles only.

MIST. TUSSI RUB. CONC.
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A favourite and economical cough mixture, containing Hydrobromic Acid, Chlorodyne, Dilute Hydrocyanic Acid, &c. Most successful in allaying post-influenza coughs that are so persistent. One or two ounces diluted with water to make eight ounces forms one of the most effective and elegant mixtures that can be made, and certainly the least expensive.

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For Nervous Sleeplessness in Children.—10 to 20 minims diluted.

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ORIGINAL ARTICLES

SOME PROBLEMS OF WOUND INFECTION*

A. A. MILES, M.A. CAMB., F.R.C.P.
PROFESSOR OF BACTERIOLOGY, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

E. H. Kettle once deplored the dominance of the bacteriologist in the study of infective inflammation—a dominance which he felt not only elbowed out the more profitable study of the host's reaction but also obscured the problem with so many irrelevant facts about bacteria that the wood could not be seen for the trees (Kettle 1927). This lecture is an attempt to show how much the "dominant bacteriologist" has contributed to the study of wound infection; his contribution is extensive and significant, but has been more successful in prophylaxis than in cure.

EARLY AND LATE INFECTION COMPARED

The bacteriologist is, in the first place, faced with freshly inflicted wounds. In them he finds bacteria apparently derived from skin, alimentary tract, clothes and surrounding dirt. The cultivation of swabs from very early wounds yields mainly indifferent cocci, both staphylococci and streptococci, diphtheroids, aerobic spore-bearers of the *Bacillus subtilis* type, and anaerobic spore-bearers. Later swabs yield a greater variety: for example, 1–3 days after infliction, wounds contain *Streptococcus pyogenes* and *Staphylococcus aureus* in addition to the bacteria already mentioned. The increase may in part be due to the growth of small initial doses of bacteria into recognisable prominence. But figures for swabs taken 4–12 days, and 13–30 days after infliction show that while spore-bearers and indifferent cocci die out there is a still greater incidence of *Strep. pyogenes*, *Staph. aureus* and *Pseudomonas pyocyanea*. The incidence of coliforms remain relatively high. It is, in fact, the frankly pyogenic bacteria—streptococci, staphylococci and the coliforms—which appear in the later cultures (Miles et al. 1940, Spooner 1941). These newly appearing bacteria may have been introduced at the time of wounding or added later. If we assume that all the bacteria in a wound grow from small numbers introduced at the time of wounding, we shall have difficulty in explaining why *Staph. aureus* and *Strep. pyogenes* often appear for the first time as late as 3 weeks after wounding, for they are not given to lying dormant in the tissues. It is easier to maintain that they are added after the infliction of the wound; and indeed, particularly in the case of the streptococci, we have strong circumstantial evidence in support of it. The pyogenic streptococci can be subdivided by serological tests into a number of well-defined types. In civilian life they reside in the upper respiratory tract of some 5–10% of the population, and if we were to select a few hundred people in a haphazard fashion, we should find that their throat streptococci belonged to a wide variety of types; no one type would predominate. But when 50 of these wounded people are gathered from different places into one ward, not only may as many as 40% be infected with streptococci but the streptococcal types are not distributed in quite so haphazard a manner as we might expect had they been picked up from the environment at the time of wounding; certain types predominate, which suggests an infection from a common source. Moreover, a predominating type often turns up late in the history of wounds under treatment in a single ward, and by keeping a close watch on the noses, throats, wounds and cut fingers of patients, nurses and medical staff it is often possible to trace the apparent course of infection by one type of streptococcus from wound to wound, wound to throat, throat to nurse's cut finger, and cut finger to another wound.

In certain Hertfordshire hospitals we seldom found *Strep. pyogenes* in wounds sampled within a few hours of infliction; yet the incidence of streptococcal wound infection in the wards varied from 20 to 70%. Colebrook and Francis (1941) estimate that 5% of their burns were initially infected with *Strep. pyogenes*, and found 70% infected in hospital. Besides streptococci, there are added infections by *Staph. aureus*, coliforms, *Proteus vulgaris*, and occasionally the tetanus bacillus, Welch's bacillus and the diphtheria bacillus. It is not uncommon to find added infections of all kinds in half the wounds of a ward. Not all these infections are serious or give rise to clinical signs of infection, but there is evidence that (apart from the quite large numbers of patients who are made seriously or even fatally ill by added infection) many milder added infections retard wound healing and certainly increase the risk of the cross-infection of clean wounds by constituting an open reservoir of potentially pathogenic bacteria.

Added streptococci originate in the nose and throats of carriers. It is the skin, and especially the skin recently infected with staphylococci, that is usually regarded as the source of *Staph. aureus*. But it is probably truer to regard the nose as its more constant origin. *Staph. aureus* may infest the deeper crypts of the skin, but on the skin itself it is a superficial transient contamination. It seems clear that the nose is the source of the skin staphylococcus, since both superficial and deep skin carriers are commonly nasal carriers. In a few tests of such double carriers in which a precise serological typing was possible the staphylococci from the nose and skin proved to be of the same subtype. The importance of the streptococcal carrier is fully appreciated; the potential dangers of the nasal carrier of *Staph. aureus* are less obvious, but none the less important in combating hospital infection, for up to 90% of the wounds in a ward may be infected with it.

A rough estimate of the extent of this nasal danger may be made by piecing together the scanty information about staphylococcus carrier-rates (Hallman 1937, McFarlan 1938, Gillespie et al. 1939), and including some recent surveys that Dr. A. C. Cunliffe and Dr. A. M. Thomas have been making in Hertfordshire. It appears that the staphylococcal carrier state in the nose, far from being the result of a temporary infection or contamination, may be the result of an early colonisation of the nose that gradually disappears with advancing age. The nose of the newborn child is sterile, but at 2 weeks old 90% of the infants in hospital wards are infested with *Staph. aureus*. The incidence drops to 50–60% in young children and to 20–40% in young adults. Of these carriers, at least half are profuse, and remain so for months on end. The figures are appropriate to our inquiry, for they were obtained mainly from hospital patients, staff or medical students, and may be said to represent the staphylococcal environment of a wounded person in hospital. We do not as yet know whether all strains of true *Staph. aureus* are equally pathogenic. The common infectors of the nose may be relatively innocuous, and wound infection may be due to more rarely occurring virulent types. But until we know more about the properties of the staphylococcal subtypes it is reasonable to assume that the high incidence and relative permanence of *Staph. aureus* nasal carriers in hospital personnel and patients, and the consequent high skin-carrier rate, is responsible for the predominance of *Staph. aureus* in the infections of war wounds. It is impossible to exclude all nasal carriers from participation in surgical work. But the risk of infection from them is reduced to a minimum if all those engaged in surgical manipulation of wounds are compelled to wear impermeable masks in the wards as well as in the theatre.

As a result of many bacteriological surveys of wounds, it may be said that the bacteria introduced into wounds by direct enemy action are much less disabling in the sum total of their after-effects than those introduced after infliction. It is also true that a great deal of this added infection is preventable. In peace-time the risk of hospital infection was small, though definite. But the aseptic technique of peace has not stood the strain of a war in which at any moment a base hospital may be overwhelmed with the additional duties of a casualty clearing station. The surgeons were the first to set their house in order over hospital infection, and in the process became part-founders of medical bacteriology. But the initiative in the fight against hospital infection has lately passed to the fever hospital and to the obstetric and children's ward, and it is to the bacteriologists who

* Abridged from the Kettle memorial lecture, delivered at the Welsh National School of Medicine in May, 1941.

worked in these places that we owe our present impetus in tackling war wound infection. The surgeon already has the prophylactic techniques at his disposal, and a rearrangement of their emphasis and application should suffice to make the wards and theatres safe.

Last year Dr. Joyce Wright and I found the hospital-infection rate in a certain neurosurgical ward at times rose as high as 30%. In four months, 15% of all wounds —air-raid or operation—were infected in hospital. The figure was comparatively low, because a careful forceps-dressing technique was employed, but nevertheless *Strep. pyogenes* was spreading from patient to patient. During the air-raid lull of the new year the ward dressing technique was carefully revised. Masking was rigidly insisted on during dressing, and a new routine instituted. Since that time Dr. Wright has maintained a detailed bacteriological watch on the whole unit. The technique was maintained even when three separate convoys of air-raid casualties had filled the wards to their limit, and the result was excellent. In spite of the presence of *Strep. pyogenes* in chronic and newly admitted wounds in the throats of patients and staff (including an epidemic of a type 4 in the throats of 7 people), and in the air of the wards, the number of patients with added infections in a second 4-month period has been 4. Of these infections 3 were in trivial wounds of the arm and leg, which were dressed by the ordinary technique; they constitute an additional proof of the efficacy of the improved precautions, for the head wounds of the same patients were dressed by the improved technique and remained without added infection (McKissock et al. 1941).

With the bacterium already established in the wound the issues are less definite. Dominating the scene is the purulent wound, infected with the pathogenic streptococci and staphylococci and those junior partners in the pyogenic axis—the various coliforms, *P. vulgaris* and *Ps. pyocyanea*. It is worth noting that we have not yet exhausted the information we can get from the bacteria themselves in explaining the variations in severity of these pyogenic infections and the changes in bacterial flora that accompany healing or exacerbations of infection. Next in numerical importance is the wound in which the initially infecting organisms, mostly saprophytes, die out in a few days and stimulate little, if any, tissue reaction. Such wounds might be called contaminated rather than infected, and they solve their own problems by never proceeding to infection. Finally, there is the wound in which essentially saprophytic bacilli find an opportunity to instigate a gas gangrene. These bacilli, in the order of their frequency in wounds, are *Clostridium welchii*, *Cl. sporogenes*, *Cl. septicum*, occasionally *Cl. œdematiens*, and a host of more or less well-defined species, all spore-bearing anaerobes. I call them essentially saprophytic, for in most wounds they die out as rapidly as other contaminants like *B. subtilis*, sarcinæ and micrococci. In a minority of wounds they may multiply with other bacteria in a superficial necrotic layer of tissue, but it is only in a few wounds so infected that gas gangrene supervenes. The opportunity for the offensive germination of the gas-gangrene bacilli is provided by areas of tissue, usually those denuded of oxygen, in which the reducing intensity, chemically speaking, is increased to a point that allows the growth of anaerobes, and this opportunity is largely removed by clearing from the wound foreign bodies, dead tissue, and anything likely to kill the remaining healthy tissue.

So far there is little definite information on the importance of those differences we can detect in the strains of *Cl. welchii* isolated from human flesh wounds. Robertson and Keppie (1941) found that there is a tendency for *Cl. welchii* strains from gas-gangrenous wounds to produce more powerful toxins than those from the merely contaminated wounds, and that the toxigenic powers of some of these gas-gangrene strains tend to be inhibited less by changes in the hydrogen-ion concentration of the media than those of the more saprophytic strains. But powerfully toxigenic strains turn up in contaminated wounds, and fatal gas gangrene occurs with the feebly toxigenic strains. We have found a similar lack of definite association between the capacity of toxin-free *Cl. welchii* strains to resist the bactericidal power of human blood, and the capacity to produce gas gangrene. Our most resistant strain came from a small granulating scalp wound that was healed in 10 days.

METHODS OF TREATMENT

To combat these bacilli we have various antitoxins, and a number of antibacterial chemotherapeutic agents, both natural and synthetic. Of the natural antibacterial substances, elaborated by bacteria and fungi, few have received extensive therapeutic trial. Gratia (1930) in Belgium and Dubos (1939) in America have both described such substances, the one from a fungus, the other from spore-bearing bacilli. In this country we have Fleming's discovery of penicillin, which is powerfully antibacterial. A full test of its value must await its production in large quantities. It has no observable toxic effect on phagocytes in antibacterial concentrations, and its antibacterial effect is not inhibited in the presence of organic matter. Its action, like that of the sulphonamides, is apparently bacteriostatic, an effect that permits the defences of the body to take adequate action against the invader (Fleming 1929, Abraham et al. 1941). The synthetic antibacterial agents include the sulphonamides and the flavines. The flavines are antiseptic rather than chemotherapeutic, though two, proflavine and 2:7 diamo-acridine, by reason of their low toxicity for tissues (Russell and Falconer 1941), approach chemotherapeutic rank. At present we know little of their efficacy against the gas-gangrene bacteria.

The sulphonamides have been extensively tried in pyogenic wounds and there is little doubt of their prophylactic and therapeutic value. They are inhibited to some extent by organic matter, particularly if the products of extensive tissue breakdown are present. But even in the presence of pus their local application reduces the streptococci, staphylococci, coliforms and spore-bearing anaerobes in wounds. There is every justification for their early employment in the treatment of such wounds, for even if they fail to destroy the bacteria they may prevent their multiplication, and thereby permit the delays in full surgical treatment that are sometimes inevitable in war. In the treatment of gas gangrene there is no similar clear-cut indication for the confident exhibition of these drugs. The occasions for test in man have been few, and in animals the result of numerous attempts to treat experimental gas-gangrene are conflicting. Attempts vary in the animals used, the dose of bacteria, and the mode of applying the drug. This variety is in a sense helpful, for the common features that can be abstracted from it tell us where the truth lies. First, the susceptibility of the gas-gangrene bacilli in the test-tube is of a much lower order than that of the streptococci, and this low susceptibility is reflected in the animal, where the oral administration of the drugs is relatively ineffective. Local therapy with the solid drug, in whose vicinity one can expect maximum concentrations, is much more effective. In the second place, chemoprophylaxis, achieved by introducing the drug along with the infecting bacilli, is more successful than chemotherapy, which only prolonged the life of animals in a few cases, and in fewer cases saved it. *Cl. welchii* infections are most successfully treated, *Cl. septique* less, and *Cl. œdematiens* least. With regard to the effect of the different sulphonamides, there is greatest disagreement over *Cl. welchii*; in general, the best are sulphathiazole and sulphapyridine, with sulphanilamide a close second. With *Cl. septique* the order is sulphathiazole, sulphanilamide and sulphapyridine, with dissidents in favour of reversing the last two; and there is agreement that sulphathiazole is outstanding with *Cl. œdematiens*. Fleming (1941) has suggested that for historical reasons we tend to think of sulphanilamide as best for streptococci, sulphapyridine for pneumococci, and sulphathiazole for staphylococci, whereas in fact the last drug is active against all three cocci. The same holds good for the gas-gangrene organisms; sulphathiazole is not merely the best drug for *Cl. œdematiens*; it appears on balance to be the best drug for the whole gas-gangrene trio.

Gordon and McLeod (1941) differ sharply from the prevailing trend of experiment with artificial *Cl. welchii* and *Cl. septique* infections. They find no trace of curative action in sulphanilamide and sulphapyridine, and only a slight prophylactic action in sulphapyridine. The reason for the difference does not lie in the dose of bacteria employed, which was 10 m.l.d., nor in the dose of drug administered. It may lie in the mode of infection, for apparently the bacteria and the drugs were introduced into artificially damaged limbs, with a syringe,

whereas most of the workers who report favourably on the sulphonamides infected their animals in open wounds and applied the drug in the same spot. If this is the reason it indicates even more strongly the necessity for a maximum local concentration of the drugs, such as would follow the precise application of the powder to the open seat of infection.

Sulphathiazole appears to owe some of its local efficacy to its moderate solubility, which, lying midway between that of sulphanilamide and the more insoluble sulphapyridine, ensures that it goes into solution slowly but in sufficiently effective concentrations. All three drugs diffuse slowly through dead tissue, but as soon as they reach tissues with active circulation they are carried away by the blood-stream. This continuous drain on the central core of solid drug in the wound results in a steep fall in concentration as one passes from wounded healthy tissue. It would be reasonable, as Hawking (1941) suggests, to supplement local with oral administration of the drug and thus, by maintaining a given concentration in the general circulation, to reduce the speed of that drainage.

ANTITOXIN AND SULPHONAMIDE ACTION

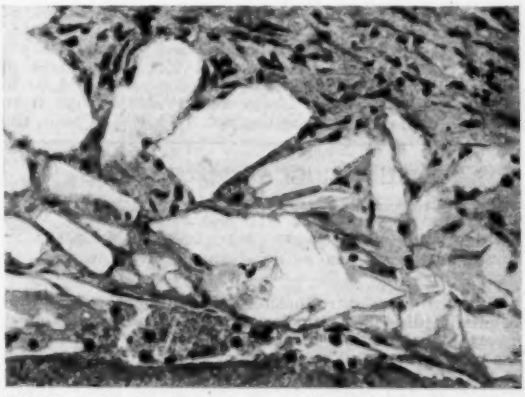
The use of antitoxin, either as an addition or an alternative to the sulphonamides, has the support of experimental work. Henderson and Gorer (1940) found antitoxin better than sulphanilamide or sulphapyridine; drug and antitoxin administered together were much more effective than either alone. Gordon and McLeod found it greatly superior to the sulphonamides as a prophylactic, and the small success they had in curing recently established infection was due entirely to antitoxin. They suggest that the antitoxin might profitably be applied locally in the treatment of gas gangrene. The analogy with local sulphonamides suggests that this would be highly effective, but we might explore the implications of this analogy before we accept it, particularly in view of the severe local reactions reported to have followed this kind of antitoxin therapy.

The effect of antitoxin and the sulphonamides on the bactericidal power of human blood for *Cl. welchii* gives some indication of their action in the body. In one experiment, for example, typical of many we have recently made, an average of 1 bacillus survived from an inoculum of 4000 living bacilli in 100 c.mm. of blood. A comparatively large dose of *Cl. welchii* toxin (2 mouse m.l.d.), though it lysed the blood, depressed the bactericidal power only slightly; an average of 8 bacilli survived. But the addition of enough antitoxin to neutralise the toxin, far from restoring the bactericidal power, reduced it still more; 45 bacilli survived. *Cl. welchii* is killed in blood only in the presence both of living phagocytes and complement, and it can be shown that the combination of toxin and antitoxin, by fixing some of the complement, impairs the efficacy of the natural antibacterial mechanism. The blood-bacterium mixture is notoriously sensitive to antiseptics, yet the three sulphonamides, in a final concentration of 6·25 mg. %, depressed the bactericidal power only slightly and temporarily. After 2 hours, unheated blood kills better than sulphonamide blood. The effect is reversed in 24 hours; sulphonamides plus blood are more effective than blood alone. Leucocytes and complement contribute largely to this sulphonamide effect, for in heated blood the drugs are comparatively inactive. Penicillin in the same concentration is much more active than any of the sulphonamides, and at no time appears to affect the leucocytes. In applying these results with blood to therapy we must avoid what Kettle used to call the Bovril fallacy. The victim of this fallacy, regarding a tube of blood with the melancholy intentness of the bullock in the advertisement, and murmuring "Alas my poor brother," insists on regarding its identity with the whole body as complete. But the results do suggest that in the wound area, where the supply of blood and therefore of complement may be restricted, the local injection of strong antitoxin to settle the toxic issue might prejudice the issue between phagocytes and bacilli. Circulating antitoxin, on the other hand, which is accompanied wherever it goes by complement, is open to no such objection, and would certainly limit the specific intoxication to relatively anæmic tissues.

In this comparison of sulphonamides and antitoxin we must remember the size of their constituent molecules. The work of Menkin (1940) suggests that large molecules of foreign protein in the circulation would be selectively removed from the blood by early inflammatory tissue, and that they would be as definitely excluded from such tissue when the inflammation had proceeded to a later stage. The dye Trypan Blue behaves in the same way towards inflammatory tissue, and experiments with tissue inflamed by the *Cl. welchii* toxin show that early fixation and later rejection of the dye occur in the inflamed part. Circulating antitoxin is likely to be similarly affected; it remains to be seen whether this is in fact so, and whether the antitoxin "fixed" in the inflamed tissue is active against the toxin that produced the inflammation.

The change over from apparent avidity to inertness on the part of the local lesion may explain the enormous difference that has been observed between prophylactic and curative doses of antitoxin. In Gordon and McLeod's experiments the minimum curative dose of antitoxin a few hours after infection was 200–600 times the amount required for prophylaxis.

These considerations do not apply to the sulphonamides. A few experiments in rabbits with early and late toxin-induced inflammation show that there is no



Rabbit fibroblasts growing between crystals of sulphapyridine, 7 days after introduction. (By permission of Dr. L. E. Glynn.)

similar fixation or exclusion of circulating sulphanilamide. Presumably the molecule is small enough to be independent of these peculiar features of the inflammatory lesion; and it penetrates wherever it can diffuse, either from a deposit of solid drug, or from the circulation. Some experiments by Dr. L. E. Glynn (1941) illustrate the small deleterious effect of the solid drugs. He introduced clots of blood into pockets in the subcutaneous tissue of the rabbit and compared the organisation of the clot with and without powdered sulphonamides. Solid sulphanilamide disappeared in 24 hours. It could diffuse directly across the fascial sheath of the underlying muscle, for these were damaged to the depth of 4–5 muscle-fibres; this negligible layer of necrosis, 0·2 mm. in depth, was soon organised. Sulphapyridine produced occasional necrosis, sulphathiazole none. There were indications that sulphathiazole and sulphapyridine depressed the formation of fibroblasts to a slight extent, but the slightness is well illustrated in a section in which proliferating fibroblasts are seen actively invading the spaces immediately between the persistent crystals of sulphapyridine (see figure).

It is not my primary intention to weigh the measures against infection in the balance, for there are many considerations upon which I have not touched. My survey of wound infection covers only a fraction of the ground, and much of what I have said I owe to the kindness of those who have allowed me to cite from unpublished work. Ogilvie has said that gas gangrene has its cause in a particular opportunity rather than a particular organism. If we have failed to define the opportunity we are in no position to be confident about the means of denying it to the saprophytic clostridia

concerned. But in the choice of a prophylactic agent against gas gangrene it must be remembered that the sulphonamides, and particularly sulphathiazole, have the great advantage of attacking most of the species that contaminate wounds; antitoxin is species-specific only. Moreover, the suppression of the other contaminants by sulphonamides removes elements which, if left to proliferate, might kill tissues and provide a nidus for the germination of the gas-gangrene bacillus.

The final test must, of course, be made in man. If the surgeon is convinced that drug or serum is harmless to the patient but needs to convince himself that it is helpful, there is every justification and every need for a clear-cut division of cases into control and test groups. And it cannot be too strongly urged that the treatment of alternate cases makes a simple and effective division. To many this arrangement will smack of the statistician, who is often unjustly accused of demanding unnecessarily difficult circumstances in the collection of data from clinical material. They may find a support for their resentment in a quotation that prefaced the 1935 volume of the *British Journal of Experimental Pathology*, which many of us believed Kettle himself suggested to the editor. It was from an O. Henry story of two gold prospectors, Pratt and Idaho, marooned for the winter in a mountain hut. They find in the hut two books to solace their exile, the Rubiayat of Omar Khayyam and a pocket encyclopædia. Idaho, who takes the book of verse, says with scorn, "What you've got is statistics, the lowest grade of information that exists. They'll poison your mind. Give me old K. M.'s system of surmises." But the moral of the story does not lie in the quotation. When Idaho and Pratt set out from their winter prison to woo the rich Widow Sampson, the one with poetry the other with statistics, it was Pratt who won her with his low-grade information.

* * *

It may seem impious to have chosen a view of Kettle's in order to dissent from it when he can no longer reply. But to do so would be in itself a memorial to Kettle as we knew him, for he was kind to dissenters, disliked piety, and was critical of unthinking respect. "You will always be treated politely," he once told a difficult worker who complained of a disrespectful attitude in the laboratory, "but respect you will have to earn." He would be content to let his views earn their full respect as time went on. And even where we first dissent, we shall find that the respect for what he said grows as the later accumulation of knowledge endorses its prophetic wisdom.

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PNEUMOCOCCAL MENINGITIS

FOURTEEN CASES WITH ONE RECOVERY

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BEFORE the introduction of sulphanilamide and sulphapyridine pneumococcal meningitis was almost invariably fatal, but in the last few years the outlook has been radically altered. There are now large numbers of reported cures, and Coleman (1940) estimates the fatality of the disease to be only about 35%. While this figure is true of the reported cases, it in no way gives an accurate picture of the prognosis. Our own experience has been discouraging and for this reason I am publishing the results of treatment of the 14 cases admitted to the Birmingham United Hospital since the beginning of 1939, a period of two years.

The main features of these cases are shown in the table; 6 appeared to be primary (i.e., unassociated with any other forms of infection) and of these, 1 recovered. This patient, a man of 22, was admitted within eight hours of the onset of his symptoms; the dosage of sulphapyridine was at least 12 g. daily, administered both by mouth and intramuscularly, and he made a good functional recovery with no permanent residual defects. Of the remaining 8 cases, 2 were associated with catarrhal otitis media, 1 with ulcerative endocarditis which was probably the primary source, 3 were complications of lobar pneumonia and 2 were associated with bronchopneumonia; 4 cases died within twenty-four hours of admission. All the cases (except case 5) were actually admitted with meningitis; 10 were unconscious. Case 4 recovered from her meningitis, as was shown at autopsy, but eventually succumbed to toxæmia associated with lobar pneumonia and empyema. Case 5 appeared to be making satisfactory progress when neck rigidity reappeared without any signs or symptoms to suggest a recurrence of meningitis. She died suddenly and autopsy showed bilateral thrombosis of the jugular veins, that on the right side extending down to the right auricle; the ears showed slight catarrhal changes only, and the meningitis was confined to localised areas, suggesting that cure would have been obtained but for this unexpected complication.

It will be seen that 2 cases had acute ulcerative endocarditis; in case 13 this was probably a primary endocarditis. Ruegsegger (1938) has pointed out that pneumococcal meningitis is often a terminal event in these cases. Case 6 illustrates many of the difficulties that may be encountered in treatment.

CASE 6.—A single woman aged 29. Splenectomy five years previously for acholuric jaundice. Admitted severely ill and slightly irrational, a few hours after a rigor and right-sided pain. Signs of right-sided lobar pneumonia. Reacted well to sulphapyridine but soon developed severe nausea and vomiting, which continued even with intramuscular injections. Temperature was dropping to normal on the third day, and chemotherapy was then stopped on account of the vomiting. Three days later signs of meningitis appeared and pneumococci were cultured from cerebrospinal fluid. Sulphathiazole (18 g.) was given for forty-eight hours, but only after the addition of sulphapyridine as well did symptoms and temperature improve (sulphathiazole 19 g., and sulphapyridine 19 g. over ninety-six hours.) Further 12 g. of sulphapyridine continued for next three days. Appeared to be clinically cured on seventh day after onset of the meningitis; c.s.f. then contained 43 cells (80% mononuclears) and normal amount of sugar. A week later temperature rose again and right otitis media developed with reddening of drum; this reacted to chemotherapy fairly rapidly, but pyrexia up to 102° F. continued for next two weeks, uninfluenced by sulphathiazole or sulphapyridine. Mastoid infection ruled out by two aural surgeons, and diagnosis of infective endocarditis seemed likely in absence of any other focus. Blood-cultures at this period gave heavy growth of pneumococci. Diagnosis strengthened by occurrence of embolus in left brachial artery five weeks after admission. After subsidence of original meningeal infection mental condition had remained good, but a week after embolus signs of meningitis again became definite and c.s.f. heavily infected with pneumococci. Rapidly deteriorated and died six weeks and three days after onset of infection. Autopsy showed generalised pneumococcal meningitis with crumbling acute ulcerative endocarditis affecting mitral valve. Ears showed no evidence of gross infection; nasal sinuses all healthy.

Finland, Brown and Raugh (1938) point out that chemotherapy is often of little avail in this type of massive bacteræmia and suggest that specific antiserum should always be given in such cases. In case 6 this proved impossible, owing to unexpected difficulties in typing. The organism responsible was thought at first, according to the Neufeld rapid typing method, to be group III, but the cultural characteristics showed that

SUMMARY OF FINDINGS AND RESULTS IN 14 CASES

Case	Sex	Age (yrs)	Associated disease	Duration of meningitis before treatment	C.S.F.	Sulphapyridine dosage (g.)	C.S.F. levels (mg. per 100 c.cm.)	Type of pneumococci	Outcome	Autopsy findings
1	M	57	Nil	1 day	At 24 hrs. purulent, sugar 0; at 48 hrs. sugar 12 mg. 100 c.cm. Turbid	21 in 72 hrs.	14·7; later 10	IV	Died 110 hrs. after onset	Pneumococcal meningitis, chiefly involving choroid plexus
2	M	66	Nil	1 ,,	Turbid	19 in 72 hrs.	..	III & IV	Died 72 hrs. after adm.	Pneumococcal meningitis
3	F	49	Nil	?	,,	16 in 54 hrs.	2·5 (after 12 hrs.)	..	Died 54 hrs. after adm.	Autopsy refused[4]
4	F	62	Rt. lob. pneum.	? 3 days	First obs., 375 cells (93% mononuclears); second clear	Uncertain	..	..	Died 13 days after adm.	Small localised empyema rt. base; meninges clear
5	F	62	Catarrhal ot. med.	4 days	85 cells	38 in 11 days	..	III	Died 17 days after onset	Bilateral jugular vein thrombosis; localised areas of meningitis.
6	F	29	Lob. pneum. Inf. endocard.	? 1 day	First obs. turbid; second 30 cells; third turbid	31 in 176 hrs.*	..	Could not be typed	Died 45 days after onset of lob. pneum.	Infective endocarditis; diffuse pneumococcal meningitis
7	M	22	Nil	14 days	Turbid (2 obs.)	18 in 80 hrs.	4 (after 10 hrs.) 6 (after 24 hrs.)	..	Died 4 days after adm.	Pneumococcal meningitis; internal hydrocephalus
8	M	1 7/12	Br. pneum.	Few hours	..	1 (intramusc.)	..	..	Died 8 hrs. after adm.	Bronchopneumonia; pneumococcal meningitis
9	M	58	Lob. pneum.	? 7 days	Slightly turbid	3 ,,	..	Not typed	Died 12 hrs. after adm.	Rt. lobar pneumonia; pneumococcal meningitis
10	M	1	Nil	? 2 days	Turbid	? 4	..	,,	Died 36 hrs. after adm.	Pneumococcal meningitis
11	M	22	Nil	8 hrs.	First obs. turbid; second normal	17 (intramusc.) 49 by mouth in 16 days	..	,,	Disch. symptom-free 35th day after adm.	..
12	M	49	Ac. tracheo-bronch.	2 days	..	..	..	III	Died 15 min. after adm.	Pneumococcal meningitis; acute tracheobronchitis
13	M	62	Ulc. endo-card.	?	185 cells (19% polymorphs)	Uncertain	..	IV	Died	Pneumococcal meningitis; ulcerative endocarditis
14	M	50	Ot. med.	2 days	Turbid.	3 (intramusc.)	..	III	Died 12 hrs. after adm.	Pneumococcal meningitis; otitis media

*Plus sulphathiazole 19 g.

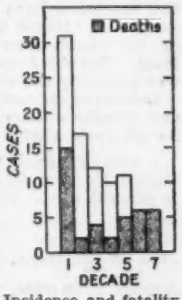
this was not so. The pneumococcus isolated from the blood-stream later in the illness was equally difficult to type and even after mouse passage failed to agglutinate with any of the sera of the 32 types described by Collins. It is hard to account for this finding but it seems likely that the development of resistance to sulphapyridine altered some of the cultural characteristics of the organism (cf. Ross 1939). It is important to continue adequate chemotherapy for many days after the subsidence of the pyrexia to give the patient every protection during the formation of antibodies, especially with strains which rapidly become resistant to chemotherapy when dosage is insufficient. The terminal meningitis appeared to be secondary to the endocarditis, though it was possibly an exacerbation of the original infection. It is difficult to say when the valve became infected, but it is clear that sulphapyridine, though given in adequate doses on the first occasion for an insufficient length of time, was incapable of preventing this complication. It is possible, of course, that the original meningitis and the ulcerative carditis both arose from the septicæmia accompanying the lobar pneumonia.

In none of these 14 cases was specific antiserum used. Sulphapyridine was used in all except one, who died shortly after admission. The doses used, when compared with other reported cases, might be considered adequate, and in case 1 it will be seen that a concentration of 14·7 mg. per 100 c.cm. of c.s.f. was attained in thirty-six hours on moderate dosage.

AGE AND FATALITY

The only constant factor that can be used to account for the lack of response to treatment is the age-incidence. Successful resistance to the pneumococcus depends on the rapid outpouring of antibodies, and these defence mechanisms might be lacking in infancy and the later stages of life. That the fatality is greatly increased in these age-groups is shown in the figure in which 94 cases have been plotted, collected from Allan, Mayer and Williams (1938), Finland, Brown and Raugh (1938), Neal and Appelbaum (1938), Young (1938), Hodes, Gimbel and Burnett (1939), Terry and Beard (1939), Hewell and Mitchell (1939), and the authors quoted by Coleman (1940).

It will be seen that the fatality in the first few years of life (especially in the first year) is extremely high; but that between the ages of 5 and 40 the prospects of cure are good. The fatal cases in this favourable group are usually those with some associated severe infection, such as pan-sinusitis, cavernous-sinus thrombosis or ulcerative endocarditis. After 40 the fatality rapidly rises and I have been unable to find any record of cure in patients over 50. Finland and his colleagues (1938) pointed out that patients in this older group appear to make satisfactory progress for a short time and then suddenly deteriorate either from sudden exacerbation of the meningitis or from some unforeseen catastrophe (as in my case 5). Finland considered that cases associated with an aural condition had a rather worse outlook than other cases. Coleman (1940) in his review of 27 reported cases could not confirm this, and it is noteworthy that Neal and Appelbaum (1938) treated 17 cases associated with an ear condition and obtained a good recovery in 13. The prognosis, then, may be summed up as follows:—



Incidence and fatality in age-groups (94 cases).

1. Pneumococcal meningitis is almost invariably fatal under the age of 1 year, and is usually fatal under 5.

2. Between 5 and 40 the survival-rate is probably between 80% and 90% in the primary types; in the presence of any severe associated infection the fatality is high.

3. The older age-groups have a bad prognosis; there appears to be an equal chance of survival or death between 40 and 50, but after 50 survival is unlikely.

4. The duration of symptoms probably has an appreciable effect on the outcome: the sooner after the onset of symptoms that treatment is begun the better will be the prognosis.

TREATMENT

Intensive chemotherapy should be instituted immediately on diagnosis. The dosage should be adequate to provide the highest possible concentration of the drug in the cerebrospinal fluid (over 10 mg. per 100 c.cm. of either sulphanilamide or sulphapyridine) in the shortest possible time. To bring this about, the drug must be administered if necessary by all three routes: by mouth, intramuscularly and intravenously (Hodes, Gimbel and Burnett 1939). It is noteworthy that, in the few series of cases reported, sulphanilamide has on the whole given better results than sulphapyridine (Schnitker 1940, Kolmer 1940). It is to be hoped that further observations will be forthcoming to explain or contradict this finding.

In the age-group 5–40, except in those cases which have severe associated infections, sulphapyridine or sulphanilamide should be given in adequate dosage without specific antiserum. With patients under 5 or over 40, however, it seems that specific antiserum ought always to be given. Large doses should be given intravenously to combat the pneumococcal septicæmia, but there is not yet sufficient evidence to show whether it should be given intrathecally in addition. Finland, Brown and Raugh suggest that it should; and the methods they advocate seem to be the most rational way of administering it. They advise intrathecal injection of 5–10 c.cm. of the patient's own serum, withdrawn after the administration of the specific antiserum intravenously, for the provision of complement in the cerebrospinal fluid. They claim that this method is least likely to give rise to undesirable reactions. It is unfortunate that pneumococcal meningitis in these groups is so often fatal within seventy-two hours of its onset, making necessary the utmost speed in the institution of therapy. Few institutions have the necessary antiserum on hand before twenty-four hours have elapsed, a delay which probably proves fatal to most cases.

SUMMARY

In 14 cases of pneumococcal meningitis there was 1 recovery; 7 patients were over 50 and 2 under 2 years.

The age-incidence of these cases and of 80 cases from the literature have been plotted to show fatalities and survivals. Below the age of 1 year and above the age of 50 pneumococcal meningitis is almost invariably fatal. The chief reason for the poor results in this series was probably the age of the patients.

Intensive chemotherapy should be given in all cases, and specific antiserum, in addition, is probably essential for all cases under 5 and over 40.

I wish to thank the honorary staff of the Birmingham United Hospital for permission to publish these cases, and in particular Prof. W. H. Wynn for his advice and criticism.

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PNEUMOCOCCAL MENINGITIS
RECOVERY WITH SULPHATHIAZOLE

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A BOY, aged 1 year, was admitted to the Eastern Hospital on Feb. 2, 1941, certified to be suffering from measles. There was a history of bronchopneumonia at 6 months. He had had a cough since Jan. 24; a rash had appeared on Feb. 1 and he had vomited on the day of admission. On examination he had a slight cough, but apart from a temperature of 100·4° F. no evidence of measles or other disease was found. During the next three days he remained febrile and was drowsy and moderately ill. Some injection of the ear drums appeared while the lungs remained clear. On Feb. 5 increasing irritability focused attention on the central nervous system, although no neck-rigidity could be detected. Lumbar puncture revealed a purulent fluid under increased pressure, containing 1775 white cells per c.cm. A gram-positive diplococcus present in large numbers on direct examination proved on culture to be a pneumococcus type II. Treatment with sulphathiazole (M. & B. 760) was instituted immediately after the lumbar puncture, in doses of 0·5 g. by mouth every four hours; the dose was gradually reduced over the next six days, the total amount given being 9·25 g. Improvement in the clinical picture could be seen within 24 hours and in 48 hours the child was sitting up feeding himself and the temperature was falling. On the 8th the cerebrospinal fluid contained 570 cells per c.cm. and one pair only of cocci were seen, the culture being sterile. On the 17th, by which time clinical recovery had long been complete, the fluid showed only a slight cellular reaction (30 cells per c.cm.). His further progress was uneventful.

Grossman [1] recently described an attack of pneumococcal meningitis in a baby of 3 months which he treated successfully over a long period with enormous doses of sulphanilamide and sulphapyridine, together with antipneumococcal serum. He was then able to find in the literature only three authentic recoveries from this disease in children under the age of 3 years. The case here described belonged to this unfavourable age-group, yet ran a comparatively mild course. How much this can be attributed to treatment is difficult to say, but improvement coincided so sharply with the administration of sulphathiazole that it is probable that this drug did modify the course of the disease. This is of some importance since treatment of pneumococcal meningitis with sulphapyridine has not been uniformly successful and it may well be that sulphathiazole is to be preferred. Banks [2] has indicated that the latter drug has some advantages in the treatment of meningococcal meningitis.

My thanks are due to Dr. Norman Begg, medical superintendent of the Eastern Hospital, for advice and permission to publish the case.

CORTICAL NECROSIS OF THE KIDNEYS
COMPLICATING PERFORATED GASTRIC ULCER

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A. J. MCCALL, M.D. LPOOL, M.R.C.P., PATHOLOGIST TO THE CITY OF LIVERPOOL SOUTHERN GROUP OF HOSPITALS

Hertzog, in 1913, described a case of bilateral necrosis of the renal cortex in a girl of 10 years who was suffering from a purulent "cryptogenic" peritonitis. Few clinical details were given. At autopsy no cause for the peritonitis was found, and the kidneys presented appearances similar to cortical necrosis of pregnancy. It appears to be the only case recorded of this renal condition complicating peritonitis. The following case was recently seen by us.

Man, aged 45, admitted to Smithdown Road Hospital on March 5, 1941, with signs of perforated peptic ulcer. Had been in hospital 4 years previously with "gastritis." Urine at that time normal, and chest showed nothing of note on X-ray examination.

Operation (Mr. R. J. Crompton) performed under open ether at 1 A.M. on 6th—9 hours after onset of symptoms—and perforated chronic ulcer on anterior stomach wall sutured.

1. Grossman, A. H. *Arch. Pediat.* 1940, **57**, 355.
2. Banks, H. S. *Lancet*, 1941, **1**, 104.

Peritoneal cavity full of fluid under considerable pressure and containing fibrin. Abdomen was closed without drainage. Urine examined before operation contained trace of albumin, but was not examined microscopically. For remainder of this day urine was passed normally: temperature rose to 99·4° F. On 9th drowsiness and oliguria were noted. Urine contained trace of albumin, moderate number of red cells and some granular casts. Blood non-protein nitrogen 250 mg. per 100 c.cm. Blood creatinine 3·1 mg. per 100 c.cm. On the 10th complete anuria and coma developed. Twitching of limbs with irregular conjugate movements of eyes. On 11th patient died in coma. Illness had been apyrexial, except for rise in temperature on day of operation. Blood-pressure was not recorded, and no bacteriological examination of peritoneal fluid was made.

Autopsy (24 hours after death).—Only permission to examine the kidneys could be obtained, but the presence of a fibrino-purulent peritoneal exudate was noted. Both kidneys were tense, slightly swollen, and presented similar appearances. The subcapsular surface was pale and showed some petechial hæmorrhages. The cortex presented the opaque yellowish-white appearance of coagulative necrosis. A few engorged glomeruli could be seen as red specks. The outline of the necrotic zone had the usual serpiginous form, and extended centrally into the interpyramidal cortex. The junction between normal and necrotic tissue was not notably hyperæmic. The medulla, pelvis and larger branches of the renal vessels appeared healthy.

Histology.—Staining by hæmatoxylin and eosin, Weigert's fibrin stain and a modification of Mallory's aniline blue (Lendrum and McFarlane 1940). The cortex showed almost confluent coagulative necrosis involving both parenchymatous and interstitial elements. There was, however, a continuous subcapsular band (0·25 mm. wide) of normally staining tissue, and small, radially arranged islets of cortex were preserved, particularly in the juxta-pyramidal region. Glomeruli in the necrotic areas showed complete absence of nuclear staining, and engorged, widely dilated capillary loops. Fibrin thrombi were frequently present in glomerular capillaries. Erythrocytes, with or without fibrin, were found in a number of the capsular spaces. Less severely affected glomeruli showed similar engorgement but with preservation of the nuclei. These glomeruli were not demonstrably larger than measured normal controls (150 μ). Slight proliferation of the tuft endothelium was occasionally seen in these surviving glomeruli. In one or two the capsular epithelium was swollen and prominent, but was never more than one layer thick. No hyaline fibrils were distinguishable in the tufts. A few glomeruli in the peripheral cortex showed slight thickening of the capsular basement membrane, and one small cyst was seen. A number of glomerular afferent arterioles and intralobular arteries contained fibrin thrombi. In the latter the thrombi were often mural in type, and fibrin infiltration was evident in the walls of one or two of these vessels. The intertubular capillaries in the necrotic zone were packed with polymorphs, a few of which had extravasated. Very occasional hyaline-droplet degeneration, and numerous albuminous casts, sometimes containing red-cells, were seen in the medullary tubules.

DISCUSSION

Mechanism of cortical necrosis.—There is now fairly general agreement that the necrosis is ischæmic in origin, but opinion has differed as to the exact level in the renal vasculature at which obstruction first occurs. The views held by different observers have been reviewed by Dunn and Montgomery (1941). From their own careful observations they conclude that the primary lesion is an extreme dilatation of the glomerular capillaries. The consequent loss of plasma leads to inspissation of the blood, stasis, and finally to complete arrest of the glomerular circulation. As a result thrombosis may occur in the glomeruli, afferent arterioles and intralobular arteries, in that order. In this way varying degrees of infarction are produced. In the early stages the pressure in the arterioles and arteries is increased owing to the distal obstruction, and fibrin is forced into the vessel walls, producing the fibrinoid necrosis which is often seen. In those cases which are associated with pregnancy it seems likely that vaso-spasm precedes, and probably determines, capillary paralysis and dilatation.

Non-pregnancy cases.—Dunn and Montgomery described 8 cases of renal cortical necrosis, none of which was associated with pregnancy, and found a further 18 in the literature. It has been shown experimentally that *Staphylococcus aureus* toxin can produce cortical necrosis of the kidney (Von Glahn and Weld 1935, de Navasquez 1938), and in a number of non-pregnancy cases a bacterial toxin seems to have been responsible. Thus Hertzog's case followed a purulent peritonitis. In our case the peritoneal fluid was not examined, but peritonitis was present. In the cases reviewed by Dunn and Montgomery, scarlatina, sore throat, postoperative streptococcal infection, pneumonia, diphtheria, "grippe" and possibly dysentery were encountered as antecedent infections. One of Dunn's own cases occurred during convalescence from appendicectomy, but the appendix was not acutely inflamed and there was no peritonitis. More recently McFarlane (1941) has described a case in which necrosis of the renal cortex followed multiple fractures and internal hæmorrhage, and in which a bacterial origin could be excluded.

Relation to acute nephritis.—Many of the infective conditions which have been associated with cortical necrosis are recognised causes of acute glomerulonephritis, and some of Dunn's cases appeared to be exceptionally severe manifestations of "war nephritis." As a result of his observations on the early glomerular lesions in acute nephritis (Dunn 1940) he and Montgomery suggest that the essential primary lesion, both in cortical necrosis and in acute nephritis, is a sudden dilatation of the glomerular capillaries, and that these cases of cortical necrosis should be regarded as examples of acute necrotising glomerulonephritis, the occurrence of ischæmic necrosis being determined by the severity of the lesion. The finding of proliferative glomerulitis and epithelial crescent formation in some cases of cortical necrosis forms a link between this condition and glomerulonephritis. Scriver and Oertal (1930) depicted crescent formation in one of their pregnancy cases, and Dunn found glomerulitis in a number of his non-pregnancy cases. de Navasquez (1935), on the other hand, found no proliferative changes in his pregnancy cases, but described crescent formation in cortical necrosis produced by staphylococcal toxin. The appearances described in the surviving tufts in our case might be regarded as evidence of slight proliferative glomerulitis.

Rôle of shock and hæmorrhage.—It has often been remarked that a retroplacental hæmorrhage precedes cortical necrosis of the kidney, and it has been suggested that the sudden fall in blood-pressure is a factor contributing to renal ischæmia. It is a question of interest whether shock, resulting from the perforation, operated in this way in our case. Capillary stasis and hæmoconcentration, both features of shock, would contribute to arrest of the glomerular circulation. The interval between the perforation and the first observation of renal symptoms might be regarded as evidence against this suggestion. McFarlane's case, already quoted, appears to be the only one in which shock and hæmorrhage alone have resulted in necrosis of the renal cortex.

SUMMARY

In a man of 45 bilateral necrosis of the renal cortex followed perforation of a gastric ulcer.

Recent observations suggest that glomerular capillary dilatation, leading to glomerular stasis, is the primary lesion in cortical necrosis. Such dilatation may result from the action of bacterial toxins, and is regarded by some as the lesion common both to cortical necrosis and acute glomerulonephritis. In pregnancy cases vasospasm probably precedes and determines capillary paralysis.

In the case described bacterial toxins were probably responsible, but shock, with its resulting capillary stasis and hæmoconcentration, may have been a contributary cause.

Prof. J. Shaw Dunn generously supplied us with material from one of his cases for purposes of comparison. Our thanks are also due to Dr. J. P. Steel, medical superintendent of Smithdown Road Hospital, for permission to publish this case, and to Mr. R. J. Crompton, resident surgical officer at the hospital, for the use of his operation notes.

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BACTERIOLOGICAL AIR ANALYSIS BY THE CLOUD-CHAMBER METHOD

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THE method to be described was developed in an attempt to evolve a means of bacteriological air sampling whereby the organisms would be isolated in a fluid rather than on a solid medium, as is the case with exposed plates and the air centrifuge.[1] A preliminary report was made in April, 1941, to the epidemiological subcommittee of the Shelter Hygiene Committee of the Ministry of Health. Further work had to be postponed, but the results obtained are published in the hope that others may follow up what appears to be a promising line of investigation.

THE METHOD

The essential features are: first, the trapping of suspended particles by drawing the air sample through a water-vapour mist; and second, the condensation of water on any particles left in suspension by cooling the saturated air. The second principle is derived from that of the Wilson cloud chamber, in which the path of electrons may be observed by depositing on them water droplets condensed from a saturated atmosphere by a reduction in pressure.

The air for analysis is drawn through a mist obtained by directing into a humidifying chamber a fine jet of steam, rapidly cooled by expansion to below 50° C. In preliminary experiments the air was drawn through a large media funnel inverted over the spout of a bronchitis kettle which served as the source of water vapour. Subsequently the funnel was replaced by a bulb-shaped Pyrex glass flask of 5 litres capacity, air and mist being admitted through an opening 2 in. in diameter in the bottom. The lip of this opening was turned up into the flask about ¼ in. thus forming a channel in which the condensate forming on the inner wall of the chamber might collect. A smaller opening resulted in too high a temperature being produced by the vapour in the flask. The bronchitis kettle was later replaced by a flask of boiling water, part of the steam from which is directed through the opening into the humidifying chamber by a glass nozzle with an orifice 1 mm. in diameter. The steam passing through the nozzle is controlled by a screw clip on the rubber tube connecting it with the boiler. In order to protect bacteria from direct contact with hot steam the nozzle should be screened by a conical shield of some poorly conducting material such as Cellophane. In the experiments to be described this was not done. The amount of steam passing through the nozzle must be controlled so that during air-sampling the humidifying chamber is kept filled with a mist at a temperature not greater than 50° C. without any excess vapour drifting back through the entry orifice.

The upper part of the chamber tapers to an outlet ½ in. in diameter through which the mixture of air and mist is withdrawn and passed through a condenser system the extent of which depends on the rate of air sampling. In our experiments, two 10 in. double-surface condensers of the Liebig type connected in series were sufficient when air was sampled at the rate of 1/10 c. ft. per min. The effect of setting the outlet to the chamber at the apex of a cone is to produce stream-lining and even mixing of the air and water vapour as they are withdrawn.

The outlet from the condenser system is connected with a suction pump through a flow meter of the manometer type and a cotton-wool plug filter, which was introduced in order to test the degree of sterility achieved in the treatment of the air sample. Where low rates of air flow are used the suction pump might be replaced by an aspirator bottle containing a known volume of water by whose displacement air can be drawn through the humidifying chamber and condenser system.

RESULTS

The result of a single experiment is set out in the table. A number of additional experiments were carried out along the same lines and with similar results.

Ten c.cm. of an 18-hour broth culture of a readily identifiable serological type of salivary streptococci was sprayed into the upper air of a small room, 10 ft. long, 5 ft. wide and 10 ft. high. An ordinary De Vilbis throat spray was used, the atomisation produced being very coarse so that most of the culture fell immediately to the ground, on which it produced a visible wet film. A quarter of an hour elapsed between the end of spraying and the beginning of air sampling; during this period the apparatus was assembled on a bench in the room. The humidifying chamber was then filled with mist and air drawn through at the rate of 1/10 c. ft. per min. At the end of each of three 15 min. periods air sampling was discontinued, the steam cut off, the condensate which had collected in the humidifying chamber flushed out with a small quantity of sterile water and the cotton-wool filter replaced by a fresh one. These operations necessitated an interval of 10 min. between each 15 min. period of air sampling. Blood-agar plates 4½ in. in diameter were exposed for 15 min. periods at the level of, and 12 in. from, the entry to the humidifying chamber. A fresh plate was exposed at the beginning of each period of air sampling. At the end of the experiment the condensers and their connecting tubes were flushed out with sterile water and from each filter the cotton-wool plug was removed, teased out in 15 c.cm. of sterile broth and then taken into separate flasks of glucose broth. These, together with blood-agar pour plates incorporating known fractions of the chamber and condenser washings and the entire filter plug washings were incubated at 37° C. for 48 hours.

It will be seen from the table that there was a rapid fall in the number of colonies on the successive plates exposed to the air of the room during the experiment. This clearly shows the selectivity of the exposed plate in demonstrating large, rapidly falling, infected particles in the atmosphere. At the end of an hour from the time of spraying, the blood-agar plate showed no streptococcal colonies after 15 min. exposure, whereas the cloud chamber still demonstrated a fairly high degree of atmospheric pollution.

COMPARISON BETWEEN DEGREE OF AIR INFECTION DEMONSTRATED BY THE CLOUD-CHAMBER AND EXPOSED-PLATE METHODS IN AN ARTIFICIALLY INFECTED ATMOSPHERE

1½ c. ft. of air sampled between	No. of strep. colonies from cloud-chamber washings	Cotton-wool filter cultures after passage of air from cloud chamber (pour plates and glucose broth)	No. of strep. colonies on exposed plates
3 and 3.15 P.M.	3000	Sterile	++
3.25 and 3.40 P.M.	450	,,	110
3.50 and 4.5 P.M.	150	,,	0

++ Too many colonies to count accurately (approx. 2500).

Air spraying was begun at 2.40 P.M. and completed by 2.45 P.M.

Air sampling was begun at 3 P.M.

The washings from the first and second condensers yielded 50 and 30 streptococcal colonies, respectively. In addition to streptococci a few colonies of staphylococci and *Bacillus subtilis* grew in each of the pour plates, except those made from the filter-plug washings which were sterile.

DISCUSSION

Steaming is commonly employed for removing bacteria and dust from the air inside hoods under which manipulations requiring a high degree of sterility are sometimes performed. At one time this method of air sterilisation was used in operating-theatres, but it has now been largely discontinued owing to the excessive humidity produced. It has been observed that bacterial pollution of the outside atmosphere is specially large at the level of the lower cloud limits (Flemming [2]); this may in part be due to the removal of bacteria from rising air currents by cloud formation.

As a means of quantitative bacteriological air analysis the method described here has certain limitations, but they do not seem insurmountable. In our experiments only low rates of air sampling were used, and a direct relationship seems to exist between the necessary condenser space and the rate of air flow over it. Further, the apparatus used in these experiments, although simple, is not easily transportable and does not lend itself readily to use under crowded or difficult field conditions. Time and facilities were not available for devising a more portable form of apparatus. The

1. Wells, W. F. *Amer. J. publ. Hlth*, 1933, **23**, 58.

2. Flemming, J. *Z. Hyg.* 1908, **58**, 345.

cloud chamber has certain advantages over the other methods in common use. Its efficiency in removing streptococci from the air appears to be high, judged by the sterility of treated air as demonstrated by cotton-wool filters. Theoretically, the efficiency does not depend wholly on particle size, and it should be possible by this method to isolate virus particles from the air. Finally, the organisms are recovered in a fluid medium; suitable dilutions can be put up for colony counts in selective media as indicated by the probable degree of atmospheric pollution and the particular organisms under investigation.

My thanks are due to Mr. T. C. Angus, D.Sc., of the London School of Hygiene, for the loan of an air pump and to Mr. E. J. D. Wilson for technical assistance.

GAS-GANGRENE OF THE EYE

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GAS-GANGRENE panophthalmitis is not common, though cases have been reported by Chaillous (1904, 1905), Darier (1905, 1906), Beneditti (1907), Schumaker (1908), Oreste (1910), James (1910a and b), Lutz (1910), Heath (1929), Ridley (1929), Hamilton (1930) Berry (1932) and Walker (1934, 1938). There seems to be no published record of any cases during the 1914–18 war, but details of one have been received in a personal communication from M. H. Whiting. Consideration of the published reports and the following 12 cases which have been treated during the past eleven years at the Royal London Ophthalmic Hospital enables the main features of the infection to be described.

TWELVE CASES

The patients were all male, ten being aged between 23 and 56, one aged 11, and one 64. All had received a perforating wound of the globe, and in seven of them this was associated with an intraocular foreign body. In other patients it was the result of injuries from such articles as pieces of stick, a stevedore's hook and the inner tube of a motor tyre. In no case had the perforation been received more than 24 hours previously. Panophthalmitis was already present in six patients when they were first seen, and the remainder developed the same condition within 24 hours of admission. Severe pain in the eye was a well-marked feature with brawny swelling of the lids as in orbital cellulitis. In two of the eyes bubbles of gas were seen in the anterior chamber. General manifestations were slight, though some cases, where there was delay in removal of the eye, showed signs of toxæmia without much rise of temperature.

The intraocular foreign body was removed from the seven patients where one was present, and in one recent injury a prolapse of the iris and ciliary body was abscised and a conjunctival flap stitched over the wound. These measures had no effect on the progress of the condition, and removal of the infected eye was performed in every case, in eleven by evisceration and in one by enucleation. Ten of the men were given anti-gas-gangrene serum. Recovery was rapid and uneventful in all, the socket healing without complication, and where signs of toxæmia were present these rapidly disappeared after the eye was removed. *Clostridium welchii* was isolated from all the eyes, and, in addition, *Staphylococcus albus* from two of them. The latter organism may be regarded as a contamination from the conjunctival sac.

ÆTIOLOGY AND PATHOLOGY

A perforating wound of the globe, penetrating the vitreous, is the route of infection in all cases, and in many an intraocular foreign body is present. No other anaerobic organism has been found, but *Staph. albus* was identified in two of my patients, and streptococci have appeared in some reported cases. The infecting organism has been thought to be present on the object causing the injury, but the variety of these and in some cases the apparent lack of contamination with soil, manure or other recognised sources of *Cl. welchii* suggests that the organism may sometimes be present in the conjunctival sac. Beneditti (1907) has described a case of gas-gangrene panophthalmitis where *Cl. welchii* had previously been isolated from a mucocele of the lacrimal sac, while Fava (quoted by Oreste 1910) has described the occurrence of the same organism on the lashes. Males are affected almost exclusively, because of the greater likelihood of their receiving perforating wounds of the globe in their work. In this series ten of the twelve patients fell within the usual age-limits of occupational diseases. There is no evidence to show that hæmorrhage, fatigue or a lowered general state of health bear any relation to the occurrence of the infection, nor does age seem to have any effect on incidence except by determining occupation.

The enucleated eyes show the changes usually found in panophthalmitis. The margins of the wound, anterior chamber, iris and ciliary body are densely infiltrated with polymorphonuclear leucocytes. The lens is similarly affected when its capsule has been injured. Many leucocytes are present in the vitreous and there is œdema, leucocytic infiltration, and destruction of the retina. *Cl. welchii* is present in the vitreous and inner layers of the retina, and Chaillous (1905) has emphasised that they avoid the zone close to the choroid, which may be expected to have a relatively high oxygen content.

CLINICAL MANIFESTATIONS AND TREATMENT

Acute panophthalmitis developing within 24 hours of a perforating injury of the globe and associated with severe pain is the characteristic clinical finding. General collapse and pallor may follow if treatment is delayed. A brown discharge from the wound may appear, occasionally containing small bubbles of gas. In the early stages an intraocular foreign body may be seen in the vitreous with a bubble of gas attached, and later gas appears in the anterior chamber.

Evisceration of the globe without opening the subconjunctival tissues is the treatment of choice, but enucleation has been performed with equal success. Anti-gas-gangrene serum has been given, but patients have recovered equally well when this has not been available. Recovery has been rapid and uneventful in all cases, and of those described here all left hospital within two weeks of the removal of the globe. In no reported case of gas-gangrene infection of the eye has the patient died from this cause. There is no record of the effect of the sulphonamides in this condition.

The course of gas-gangrene infection of the eye thus differs materially from that in other parts of the body; this may be traced to anatomical peculiarities. The factors which predispose to infection by gas-gangrene organisms are:

1. Inadequate drainage of deep wounds.
2. Presence of soluble calcium.
3. Presence of foreign bodies, devitalised tissue and blood-clot.
4. Impairment of circulation, as by tight bandaging.
5. Involvement of muscle in the wounds.

A perforating wound of the globe has no adequate drainage in many cases, and the vitreous, which is an inert substance without blood-vessels, contains soluble calcium. For these reasons the globe is a potential site of gas-gangrene infection. Elsewhere in the body the infection spreads in the tissue planes between muscle-fibres; lymphatic spread is slight, and invasion of the blood-stream is a late occurrence. No muscle tissue connects the interior of the globe with another part of the body, and it has no true lymphatics. The infection tends to remain localised until its severity becomes obvious, and eradication of this local infection prevents further spread.

SUMMARY

Twelve cases of gas-gangrene panophthalmitis following a perforating wound of the globe are described. Evisceration was performed in each case and recovery was rapid.

The panophthalmitis develops within 24 hours of the injury and is accompanied by severe pain but little general disturbance.

No deaths have been reported from this condition.

I should like to thank the members of the surgical staff of the Royal London Ophthalmic Hospital for permission to publish these cases, and Dr. S. H. Browning who carried out the bacteriological investigations.

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FORTY CASES TREATED AT THE ALLENDALE CURATIVE WORKSHOP

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REHABILITATION needs serious attention at present. An account of the first year of work at the Allendale Curative Workshop, opened at Clifton, Bristol, in 1939, is therefore of interest.

The premises consisted of a former hotel with large ground-floor rooms and nearly an acre of garden. Work had to be experimental, and each patient was made a special study. Among the personnel was Miss Mary Macdonald, member of the Association of Occupational Therapists, and head of the Dorset House School of Occupational Therapy. She had then lately returned from a tour of orthopædic hospital occupational therapy departments in America, having been given a research grant for this purpose by the Pilgrim Trust. Dr. Eugen Weissenberg, formerly in charge of the physiotherapy department at the university clinic, Vienna, joined us as a student. Miss K. Barber, another member of the A.O.T., and now in charge of occupational therapy at a Naval hospital, was also with us, and we had an enthusiastic teacher in Mr. R. C. Cole, who was an excellent joiner. Students of the Dorset House school engaged in their clinical practice with patients.

Weaving and light crafts were carried on in a room which measured about 19 ft. by 17 ft. and allowed space for 10 patients. Slightly heavier work, such as block printing and basket-making, was undertaken in a room (20 ft. by 15 ft.) which provided space for 9 patients. More strenuous work, such as joinery and metal work, was carried on in a long room (42 ft. by 15 ft.) where benches, a lathe, and bicycle and treadle saws were provided; some embossing presses which had been given to us were also in this room. The old dining-room (30 ft. by 20 ft.) was provided with a billiard table, and the conservatory gave room for darts.

The first 40 cases show what useful work can be accomplished. They came chiefly from fracture clinics at the hospitals, and were chosen by their surgeons because of some complication calling for special attention—joints fixed by adhesions, or bad habits of posture. No patient was taken without prescription and full instructions from his doctor; in the case of patients from the fracture clinic, the occupational therapist in charge attended regularly at the clinic when the orthopædic surgeon was re-examining the patient, and heard his fresh instructions. A report from the hospital almoner was also received on each case sent up. Treatment was given in the mornings only, but the whole day should be occupied if possible before the patient is discharged back to work.

CASE-HISTORIES

CASE 1.—A woman of 23 with arthrodesis of tuberculous hip. After operation she had developed a functional disease of the knee-joint. She was lacking in self-confidence and was too conscious of her disability. Her inability to sit at an ordinary table seemed the chief cause of her unhappiness and also her inability to return to her work as a shorthand-typist. She was taught to weave on a small loom with hand controls in order to interest her in the subject without referring to her leg. She was then promoted to a foot-power loom in which the warp was raised or lowered by flexing the knee-joint. While using the hand-loom she had become so keen on the texture and pattern of the material she was weaving that she was glad to perform the necessary movements, and was soon able to realise that her knee was quite capable of being bent to a more æsthetic posture. Her gait improved at the same time. She asked to stay on for a few weeks to finish the length of material she was weaving and then returned to her office work.

CASE 2.—A man of 53, suffering from the after-effects of acute infective polyneuritis. He had been completely paralysed for several months but had recovered sufficiently to walk, and by several trick movements he could feed himself. Treatment began with weaving a rug on a frame threaded with a warp of string. The patient's deltoid and exterior muscles were weak and could not bear the weight of his arms so his arms and hands were slung in canvas loops from brackets extended from the top of the frame. He had a spasmodic contraction of the shoulder muscles which relaxed when his arms were suspended. Improvement became evident in the first few days, since the patient enjoyed the work. The next stage was to support the wrists only on an adjustable slat placed across the frame, again leaving the fingers free to weave and to push the threads into place, thus getting active extension of the fingers and wrists. As the muscles improved in tone and strength, new crafts were prescribed, such as knotting dog leads, stool-seating and woodwork. The dart-board for a few minutes each day helped in the cure.

CASE 3.—A man, aged 61, who had had a compound fracture of the radius from a conveyor-belt accident. His shoulder had been strained, and he had arthritis of shoulder, elbow and wrist with much residual disability of shoulder, arm and forearm. Mental depression was pronounced. Treatment was first given in the form of easy weaving on small hand-loom; at this time the therapist was making friends with the patient and gaining his confidence. Later he made a warp on the "mill," encouraged by the knowledge that the warp was needed for another patient's work. An occupation had to be chosen that could be carried out at a level which gave easy abduction of the upper arm to begin with; this was increased gradually by raising the height of the mill without the patient noticing that he was doing more. As soon as he realised that his angle of abduction had increased his confidence was aroused and he then willingly coöperated in carrying out the changes in his work that increased the effort needed. His recovery was completed by getting him to sand-paper and paint screens raised to a level above his shoulder and to drill holes in a solitaire board, which exercised flexion and extension of wrist. Finally he did weaving on a large foot-loom which enabled him to get larger movements; easy supination was achieved by throwing and catching the shuttle.

CASE 4.—A left-handed man with compound fracture of left proximal phalanx of ring finger and simple fracture of little finger. Even passive extension of these fingers was impossible. Treatment was by joinery, which was his hobby; first he did planing with fingers extended as far as possible on the plane, and then sawing and generalised movement, with various tools, to ensure complete movement and suppleness. The patient was entirely coöperative and the fingers became almost normal.

DISCUSSION

These cases bring out the importance of the muscular spasm which often develops before treatment is begun. Without occupational therapy this is difficult to overcome because the patient has allowed the wrong posture to become a habit. Occupational therapy replaces in the patient's mind the image of a limb that he cannot use by one of a piece of work which that limb is accomplishing. Much depends on the atmosphere into which the new patient is introduced. Allendale was essentially a happy place where people felt they would get well. Each patient was welcomed and made to feel that his difficulties and disabilities were understood. His primitive impulses to investigate new surroundings, to show what he could perform, and to join in the activities of a group, all had to be stimulated; and when the appropriate emotion had been aroused the impulse was directed at once into an activity that helped his recovery. His fear and suspicion had to be circumvented. It usually took a few days to start a patient off well; many grasped the idea of what was intended in the first few minutes and became real enthusiasts in helping newcomers, but others needed much care to begin with; but once they realised that a change had begun in the injured limb, their coöperation could be relied upon. Special apparatus, designed by Dr. Weissenberg, was available to measure

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the angle of movement, and the patient could thus see from an actual graph what improvement he had made.

Experience has taught the following rules:

1. The craft chosen must provide the exact muscle movement needed at each stage. It must be changed as the patient changes.

2. The occupational therapist must superintend the movements continually; she must, therefore, have a complete training in anatomy and physiology, such as is required for massage.

3. The patient's mind must be concentrated on the accomplishment of the work on which he is engaged. Therefore it must be something that he enjoys doing and knows to be useful.

4. The degree of strenuousness must be carefully regulated. Premature use of heavy tools can only do harm; and to continue light work too long may produce a dilettante habit, and delay a man's return to his own work. The equipment must, therefore, include apparatus for heavy sawing and hammering. Work should be increased until the patient is doing a full day's activity, which can include digging in the garden and pre-vocational work. Games are a valuable adjunct. A patient who thought he could not play billiards was seen to be acting as marker to the players; he walked round and lifted his arm to mark, unconsciously exceeding what he believed to be his capacity.

Fear of infringing the rules of insurance companies had to be overcome. Some patients thought that treatment might be counted as "work" and that it would reduce their compensation; this doubt was best removed by the surgeon in charge of the case. Only one man expressed fear of his trade union objecting, and asked "what the pay would be" for his work.

The cost is important. Only one of the first 40 cases was paid for by an insurance company. Nearly all were compensation cases and the money was just enough for the man to live on; most could not even afford their fares to the curative workshop. A small part of the cost has been covered by the Dorset House School of Occupational Therapy. It is hoped that in time insurance companies will realise that occupational therapy lessens and shortens disability and therefore reduces cost. Insurance companies in America pay for such treatment and even run their own rehabilitation centres for the injured workpeople whom they are compensating, because they know it pays them to do so. Insurance companies in England already pay for medical treatment, nursing and massage, and might well make wise expenditure on this great aid to recovery.

We have had to depend entirely on voluntary attendance, and it is difficult to ensure that the patient can be convinced in the first or second visit that it is worth while to persevere with treatment, perhaps at some considerable expense of energy and of money for fares. Those who are intelligent enough to grasp at once the principle involved become enthusiastic quickly and help newcomers to settle in. But while numbers are small those nearing recovery are few; and those who have recovered have gone. Definite instructions from the insurance companies paying compensation would help, at this stage, to ensure regular attendance and consequent success.

The injuries and disabilities treated included: fractures of humerus, radius and ulna, wrist, metacarpals, phalanges, scaphoid, os calcis and cervical spine; arthritis, arthrodesis and ankylosis of joints associated with such fractures; dislocation of the elbow; valgus deformity of the feet; chronic strains; pareses of musculospinal, median, ulnar and circumflex nerves; cerebral palsy; laceration of muscles and severed tendons after repair; limitation of movement after osteomyelitis of the carpus; tuberculous osteitis of hip and spine; acute infective polyneuritis; post-encephalitis; and traumatic neurosis. Results are summarised in the following table.

At the beginning of the war arrangements were made for the workshop to undertake treatment under the E.M.S.; but enemy action having made it inadvisable for patients to remain in Bristol the workshop was transferred elsewhere. Bristol patients are treated at Winford Hospital under Miss G. E. Barnes and Mr. R. C. Cole in the wards and in a special occupational therapy hut. The Dorset House School of Occupational Therapy has now been transferred to Barnsley Hall Emergency Hospital, Bromsgrove, where it is fortunate in being under the direction of Dr. Andrew Shepherd, the medical superintendent, who has paid special attention to occupational therapy in his hospital for many years. Active rehabilitation work is again in progress there, and with the backing of the Ministry of Health will be on a much larger scale than was possible at Allendale.

LENGTH OF TREATMENT AND ITS RESULTS IN 40 PATIENTS (32 MEN, 8 WOMEN) OF VARIOUS AGES

Age (years)	Cases	No. of treatments	Cases	Length of treatment (months)	Cases
10–19	2	Less than 5	6 | 13	1	9
20–29	5	5–9	7 /	2	15
30–39	4	10–19	9	3	4
40–49	5	20–29	6	4	4
50–59	10	30–39	5	5	1
60–69	8	40–49	3	6	..
70–79	1	50–59	4	7	2
Not given	5			8	1
				9	1
				Attended only once	3

Cured or much improved	25 cases
Slightly improved	7 "
Not improved	5 "
Only attended once	3 "
Total	40

SUMMARY

A report is given on the first 40 cases treated at the Allendale Curative Workshop, attached to the Dorset House School of Occupational Therapy, Clifton, Bristol; 4 cases are described fully.

The cost of rehabilitating patients by occupational therapy might well be borne by insurance companies, as it is in America; this would allow of extension of this valuable form of treatment.

I wish to thank Dr. E. Weissenberg and Miss E. M. Macdonald for their help in preparing this report, and to Dr. H. H. Carleton, Mr. K. H. Pridie, and Mr. A. L. Eyre-Brook for allowing me to report on their cases.

LOCATION OF FOREIGN BODIES BY A RADIO-FREQUENCY PROBE

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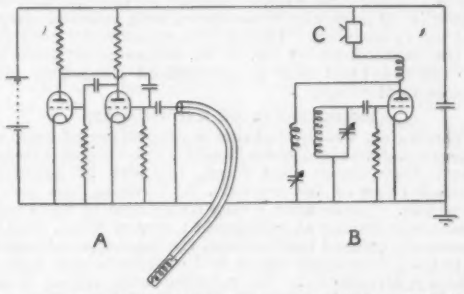
IN THE LANCET of May 31, 1941 (p. 699), mention was made of an instrument, described in a broadcast from Germany, for locating metallic particles embedded in the body. The device, which is intended to take the place of X rays in the operating-theatre, does not appear to have been used to any appreciable extent in this country.



An experimental set has been assembled at this hospital. The high-frequency oscillator (A in the diagram), working on a frequency of the order of 10^6 or 10^7 cycles per second, has the whole of its tuning inductance in the form of a search coil which can be moved about near the patient, and the second oscillator (B), working on a slightly different frequency, acts as a detector, and produces in the loudspeaker or telephone (C) a beat note

equal to the difference between the two frequencies. When the search coil comes near a piece of metal its inductance falls slightly, and the resulting frequency change is at once noticed in the note from the apparatus.

The possible choice of radio-frequency is very wide: the highest values give the greatest sensitivity to metallic bodies, but their practicability is limited by the stability of the apparatus and by the increasing effect of dielectric materials in the vicinity of the search coil relative to the effect of the metal itself. A frequency of about 3×10^6 was found to be about the optimum. Using this frequency, the apparatus will indicate the presence of a sixpenny piece at a distance of half an inch, and particles down to the size of a small pin closer to the search coil. Larger bodies may be detected at slightly greater distances. It does not seem possible to extend the effective range of an instrument working on this principle much beyond these values.

The instrument is likely to be of value, in conjunction with X-ray examinations, for indicating the approximate position of metallic substances, in particular for assisting the surgeon while operating. It cannot, it seems, be regarded as comparable in value with X-ray methods, by which the number and size of the particles are shown as well as their precise positions within the tissues.

PULMONARY TUBERCULOSIS IN THE SERVICES

SURVEY OF 100 CASES

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RANDAL STALKER, M.B. EDIN.
LATELY ASSISTANT MEDICAL OFFICERS AT A SANATORIUM

A SURVEY has been made of 100 soldiers and airmen suspected of having pulmonary tuberculosis who were sent directly to one sanatorium from military hospitals and sick posts. The cases were admitted without selection in the order of application for beds. Usually they came three or four weeks after the diagnosis had been made. There were all types of soldiers, in all stages of the disease. Some seemed comparatively healthy, some were evidently moribund. We believe that this series of 100 consecutive admissions between June and December, 1940, is likely to be representative of the incidence of pulmonary tuberculosis in the Army and R.A.F. at that time.

Eight men were finally regarded as non-tuberculous, and were diagnosed as follows:

Chronic bronchitis	2
Postpneumonic effusion	1
Postpneumonic fibrosis	1
Pleurisy (no tuberculous basis found)	1
Lung abscess	1
Effort syndrome	1
Congenital cystic disease of lung	1

The case of congenital cystic disease had received sanatorium treatment for tuberculosis at the age of seven. After four weeks' military service (he had been a chef in civil life) he broke down with malaise, pleurisy and heavy staining. Lipiodol bronchography performed at the sanatorium by Dr. J. W. Seymour revealed that he was a typical case of generalised congenital cystic disease of the lung.

RECRUITMENT OF KNOWN CASES

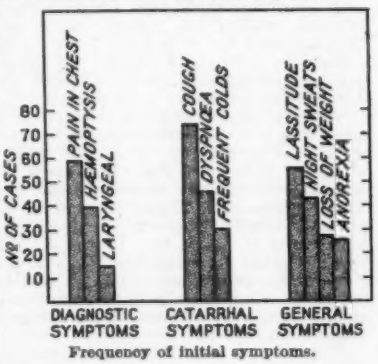
The series, which contains a proportion of men who enlisted before the Public Health (Tuberculosis) Regulations, 1940, came into force, includes 10 previously notified cases of tuberculosis, 6 of whom had been in sanatoria. There were 4 men considered to have active pulmonary lesions at enlistment; one of these, who had previously refused institutional treatment, was invalided after his tuberculosis officer had communicated with the military authorities. An arrested case whose history has been published (Aspin 1940) had been discharged from the Army in February, 1940, after a breakdown. Before June in the same year not only had he contrived to re-enlist in another regiment but he had broken down and had been invalided for a second time. At the time of enlistment 3 other men had quiescent pulmonary lesions, while 2 who were previously non-pulmonary cases broke down in the Service with pulmonary lesions.

Most of these men had concealed some essential part of their history when they came before medical boards, and one or two had deliberately made false statements. Although one man admitted that he had joined up to get a "soft job," and revealed a previous history of sanatorium treatment when he found himself on the parade-ground, the others gave us the impression that they felt they were helping their country when they enlisted. Under the Public Health (Tuberculosis) Regulations, 1940, the medical boards who examine recruits are now made acquainted, as far as possible, with the previous history of examinees whose names are on the tuberculosis registers. In addition, the Ministry of Labour now asks every examinee before a medical board to sign a declaration that he has not at any time suffered from tuberculosis. In this way the future recruitment of known cases of tuberculosis should largely be avoided. The need for such measures is shown in a series published by Kersley (1941) who, in the first 100 men that he examined and boarded out of the Army, found clear evidence that 18 had been in sanatoria and that 15 more had been suffering from the disease before enlistment.

MODE OF ONSET

In about two-thirds of our cases the onset was gradual. Several symptoms had usually appeared before the soldier reported sick. In the remainder the onset was more abrupt and indeed often dramatic; 9 men reported sick after a considerable hæmoptysis, which in 6 had happened while on duty. One man was digging in a deep trench when suddenly he developed a spontaneous pneumothorax. There were 18 cases of pleurisy with effusion in which sudden severe pain was the presenting symptom. Of these men, 10 were well and gave no symptoms or signs of chest trouble until the day the pain began. In these 10 cases fluid was demonstrated 4–25 days after the onset of the pain.

Examination of the symptoms present when the men reported sick showed that there were only 20 cases in which there had not been pain in the chest, hæmoptysis or staining; 59 men said they had pain in the chest; 39 had coughed up blood or blood-stained sputum; 18 reported both pain in the chest and hæmoptysis. The symptoms present at onset are shown in the figure.



Frequency of initial symptoms.

In 7 cases the diagnosis was made while they were under investigation in hospital for apparently unconnected conditions—hernia, error of refraction, gastritis, mastoid infection, wounds, dysentery and acute encephalomyelitis; 2 men complaining primarily of hoarseness were diagnosed as tuberculous by ear, nose and throat specialists to whom they were referred.

A history of considerable distress during physical training was given by 24 men; of these, 14 had to do harder physical work since joining up. Of the 76 men who felt no undue distress during physical training 21 had to do harder physical work. While the disease was more advanced in cases showing distress during physical training, previous occupation seemed to influence the degree of dyspnœa experienced. It is evident that a labourer would not complain of breathlessness after exertion that might be troublesome to a sedentary worker.

NATURE OF LESIONS AND STAGE OF DISEASE

Obviously abnormal physical signs in the chest were present in 48 cases and clubbing of the finger-nails in 15.

In 46 men the lesions were unilateral, while 53 showed bilateral disease. Cavitation was present in 40 cases,

including 14 in which one lung was only involved. There were 18 cases with pleural effusion, in 11 of which underlying shadowing was visible; 1 of the simple effusions was regarded as non-tuberculous. Definite signs of fibrosis, as shown by displacement of the heart or trachea, or thickening of interlobar septa, were found in the radiograms of 14 cases, while 20 more showed less obvious evidence of contracting lesions. In 13 cases there was definite calcification, and in 8 of these the calcified areas were well outside the hilar regions.

When the original diagnosis had been confirmed, 92 cases remained. These were arranged according to the classification of the Ministry of Health into class TB minus (sputum negative or absent); class TB plus (sputum positive) groups I, II and III (early, moderate and advanced cases). The proportions were found to be: TB minus, 35·9%; TB plus group I, 11·9%; group II, 41·3%; and group III, 10·9%. To compare these figures with those from an area with a highly developed tuberculosis scheme, the numbers of new patients with pulmonary disease applying for treatment during 1936, 1937 and 1938 were obtained from Dr. G. Lissant Cox, central tuberculosis officer for Lancashire. The 9 men, who were actually on the register at the time of enlistment, were removed from the series of Service cases, and the 83 remaining new cases compared with the new cases applying for treatment under the Lancashire scheme.

TABLE I—STAGE OF DISEASE IN SERVICE CASES AND IN NEW CASES APPLYING FOR TREATMENT IN LANCASHIRE

Stage	No. of cases		Percentage	
	Lancashire	Service	Lancashire	Service
TB minus	1209	33	35·5	39·8
TB plus group I	271	8	8	9·6
TB plus group II ..	1473	35	43·3	39·8
TB plus group III ..	451	9	13·2	10·8
Totals	3404	83	100	100

These two sets of figures show considerable similarity. A casual inspection might suggest that the Service cases were slightly less advanced, but in such a small series the differences might easily be expected as a sampling error. It is concluded that in these soldiers and airmen pulmonary tuberculosis was diagnosed while the disease was no more advanced than it would have been in new cases applying for treatment under the Lancashire scheme.

PAST HISTORY AND DURATION OF SERVICE

Kayne (1940), in a survey of 134 cases, found that the main criteria adopted by medical boards in selecting cases for special examination were statements of tuberculosis in the family, "pleurisy" in the past, or admission to a sanatorium or attendance at a tuberculosis clinic in childhood or adolescence. Since in his series he found only 2 men with active tuberculosis and 1 with recently active tuberculosis, Kayne concluded that histories of tuberculosis in family and pleurisy in the past as given by the recruit cannot be relied on to detect more than a small fraction of recruits with either active or healed pulmonary lesions.

In the present series 18 out of 92 cases of tuberculosis gave a history of a parent, brother or sister either being treated for pulmonary tuberculosis or dying with the disease; 5 of these cases and 10 others gave a history of hæmoptysis or pain in the chest with pyrexia before enlistment. These figures suggest that in Kayne's series the lack of positive findings may have been due to unreliable statements and the concealment of relevant facts by the recruits themselves. This unreliability has been confirmed in our series by the enlistment of known cases of tuberculosis. Others who wished to be discharged from the Army because they had been worried about their health freely confessed that they had made false statements, or had withheld essential information, when they were examined by the medical recruitment board.

Three-quarters of these men were conscripts whose military service amounted to less than a year. Individual service, however, varied over a wide range. A Q.M.S. had been 24 years with the colours. An "AC2" had 5 days' service to his credit. While 4 old regulars could muster 64 years' service among them, 12 others could not together make up six months' service (table II).

TABLE II—DURATION OF SERVICE

—	Less than 1 month	1–3 months	3–6 months	6–12 months	1–2 years	More than 2 years
No. of cases	16	18	19	23	14	10

DISCUSSION

Tuberculosis among men who served in the last war gave rise to serious problems even in the postwar years, and pensions for tuberculosis accepted by the state as "directly attributable to, or seriously aggravated by" military service continued to be given for many years after the war was over. Mitchell and Smith (1931a) state that 65,370 such pensions were awarded up to March, 1929, representing 7·6% of the total pensioned disabilities up to that time. Positive sputum was then the chief criterion for the diagnosis of pulmonary tuberculosis (Joint Tuberculosis Council Report 1939). Although the wastage in man-power from tuberculosis during the last war was negligible (Mitchell and Smith 1931b), many men suffering from pulmonary tuberculosis were returned to duty, with a consequent risk of infecting their comrades. Thus, from 1916 onwards 21% of the cases arising in the British Army were returned to duty (Mitchell and Smith 1931c).

The problems presented in this war by tuberculosis arising in the armed forces seem likely to be less acute. The death-rate from pulmonary tuberculosis has fallen steadily, and is now less than half what it was in 1918. Enlistment of known cases of tuberculosis, so common in the early stages of the last war, will be largely prevented by the new regulations. The risk of contact infection is further diminished because men diagnosed as tuberculous are now returned to duty only in exceptional circumstances. All examinees before medical boards suspected of being tuberculous are at once referred to the tuberculosis officers for special examination. Our figures show that in one small series at least tuberculosis arising in soldiers and airmen was diagnosed as soon as it would have been among civilians and that more than a third of these men were negative cases. Cases discovered in the Services are sent to special hospitals where full treatment is started at once, and when they are discharged from the Services, this treatment is continued by their local authority. At least one tuberculosis colony, the Papworth Village Settlement, is already offering the benefits of colonisation to suitable cases invalided from the Services.

These real advances are not enough to prevent the recruitment of men likely to break down with active pulmonary tuberculosis within a few months of joining the Services. In our series, out of 92 men, active lesions had been found within three months of enlistment in 29 cases (31·5%) and within six months in 48 cases (52%). These figures are less disturbing if it is remembered that mass radiography, whenever it has been performed on symptom-free people, has revealed active tuberculous lesions in 0·5–5% of them. Heaf (1940) has discussed the value of mass radiography in peace-time in combating the spread of infection by revealing the hidden active cases among the apparently healthy population. Even when men have previously been examined clinically, mass radiography has demonstrated some, though fewer, unsuspected active lesions. Berner (1939) in 10,852 picked storm-troopers who had been screened, found 0·8% of such cases. Among 9000 recruits from the Australian Imperial Forces, Cooper (1939) discovered 0·55% of active cases, and Galbraith (1941), in a later report, states that out of more than 100,000 such recruits 0·56% showed radiological evidence of active pulmonary tuberculosis. Sheldon Dudley (1941), reporting the results of mass radiography in the Royal Navy, where screen-photography is now performed as a routine, found an incidence of 0·32% active cases of pulmonary tuberculosis in 11,000 new entrants.

Kayne (1940) holds that without routine radiological examination the detection of unsuspected pulmonary tuberculosis in recruits is impossible. If the administrative and technical problems be overcome, there seems to be a strong case for the extension to the Army and

R.A.F. of mass radiography by screen-photography using 35 mm. cinema film. The position has been ably summarised by Bentley and Leitner (1940):—

"It is not suggested that screen-photography will abolish tuberculosis from the Services, but it would eliminate a sensible proportion of tuberculous subjects who should not be allowed to serve. It is thought the saving in pensions alone would more than outweigh the cost of the investigation."

Probably many men in our series were unsuspected cases of tuberculosis when they joined up, and we have tried to find out how many would have shown radiological lesions visible by miniature radiography at the time of enlistment.

No-one would deny the difficulty, and some would question the possibility, of estimating the radiological appearances some time before a radiogram was taken. We were guided by duration of service, extent and density of the lesions, presence of cavitation, and clinical course of the disease. When a man had served for longer than six months, especial attention was given to definite signs of a contracting lesion, presence of hard shadowing or calcification in the lung fields, and previous history suggestive of tuberculosis. The cases have accordingly been divided into two groups—those in which miniature radiography at enlistment would, in our opinion, have revealed lesions suggestive of pulmonary tuberculosis, and others in which miniature radiography would have given no help (table III).

TABLE III—SERVICE CASES IN WHICH MINIATURE RADIOGRAPHY AT ENLISTMENT WOULD PROBABLY HAVE REVEALED LESIONS SUGGESTIVE OF TUBERCULOSIS

Period of service (in months)	No. of cases	Estimated result of M.R.	
		No help	Suggestive lesions
Less than 1	16	5	11
1– 3	18	5	13
3– 6	19	7	12
6–12	23	15	8
12–15	11	9	2
More than 15	13	13	0
Total	100	54	46

We estimated that in 46 cases abnormal shadowing or displacement of the mediastinum would have been clear enough at enlistment to have been detected by miniature radiography, though careful physical examination and history-taking had revealed no evidence of tuberculosis.

SUMMARY

A survey has been made of 100 Service men suspected of having pulmonary tuberculosis. The stage at which the disease was diagnosed in these men did not differ materially from the stage at which cases are diagnosed in civil life.

Reasons are given for the belief that in this war spread of disease by infection in the Services is likely to lead to fewer cases of pulmonary tuberculosis than in 1914–18.

In this series active pulmonary tuberculosis was found within three months of enlistment in 29 cases, and within six months in 48 cases.

Miniature radiography at enlistment would probably have revealed definite lesions in 46 of our cases.

We wish to thank Dr. J. W. Seymour, late acting medical director of the sanatorium, for permission to report these cases and for advice; Dr. G. Lissant Cox, who allowed us to quote figures from his annual reports; and Dr. George Jessel, who first suggested this survey.

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ANTERIOR DISLOCATION OF RADIAL HEAD WITH FRACTURE OF SHAFT OF ULNA

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IT cannot be said that anterior dislocation of the head of the radius with fracture of the shaft of the ulna has suffered in the past from lack of attention or investigation. The lesion is relatively rare, but recorded cases show that it has attracted notice since the beginning of the last century, when it was first described by Monteggia who recognised it without the aid of X rays. I record here 4 new cases illustrating the successive points emphasised by various authors during the last ten years.

It has been taught for some time that where there is a fracture of the shaft of the ulna with displacement the elbow-joint should always be included in the radiogram, because shortening of the ulna necessarily means the disruption of one or the other radio-ulnar joints, usually the superior one (Campbell 1929, Corbett 1931, Wilson 1933). Cases 2 and 3, reported here, however, showed subluxation of the head of the radius with only an incomplete fracture of the shaft of the ulna, unaccompanied by any displacement; so that it seems important always to examine the elbow-joint both with the fingers and by means of X rays.

Several writers have paid great attention to the exact mechanism causing the injury, but it seems to me more important to recognise that this dislocation of the radial head can only take place as a result of disruption of the orbicular ligament. Hunt (1939) and Campbell (1929) both describe this ligamentous tear, as do several later observers, but the standard textbooks of fractures (e.g. Scudder 1926, Sinclair 1931) made no mention of it until it was referred to by Kellogg Speed (1935) and Böhler (1935). Wilson (1938) gave a complete description of the pathology. My own observations have confirmed the ligamentous tearing in each case, and I have particularly noted that the torn ends were always retracted deep to the radial head and that, at the ulnar attachment, the ligamentous strands were so short and torn as to be useless for reconstruction.

CASE-HISTORIES

CASE 1.—Age 13. Fell on the right elbow in November, 1938. X-ray report of forward and outward dislocation of the head of the radius and fracture of the ulna. The dislocation was replaced manually, but the reduction was not stable. At open operation on Dec. 6 the ordinary external lateral approach to the head of the radius was used, but it was difficult to reach the front and inner side of the head. The torn edges of the orbicular ligament were demonstrated and an attempt made to suture them. The radial head dislocated for the second time a few weeks later, but despite the deformity the functional result was good and by April, 1939, there was full range of elbow movement and the

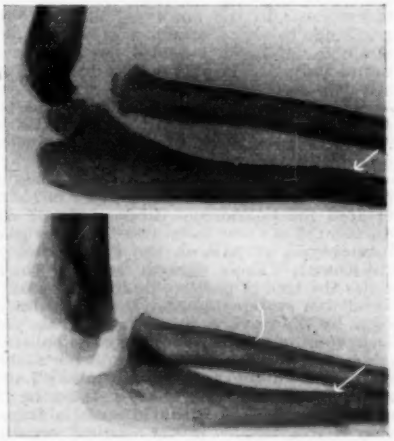

FIG. 3—Case 4. (*a*) Lateral view of elbow showing dislocation of head of radius. (*b*) Lateral view of elbow showing stable reduction of dislocated radial head after reconstruction of orbicular ligament.

joint appeared to cause the patient no trouble.

CASE 2.—Age 10. Accident on Aug. 8, 1939. Radiography revealed an anterior dislocation of the head of the radius accompanied by an incomplete fracture of the ulna without any displacement. Again the head of the radius was easily replaced by manual reduction under anæsthesia, but as in case 1 the dislocation recurred readily. At operation on Aug. 16 an anterior incision at the outer side of the antecubital fossa was used; it was particularly noted that access to the head and neck of the radius was much easier and was obtained by retracting supinator longus outwards and brachialis anticus inwards. In this case also the torn ends of the orbicular ligament were found curled up deep to the radial head, but even with the better approach attempts at suturing the ligamentous remains were unsuccessful. X rays showed that the dislocation recurred.

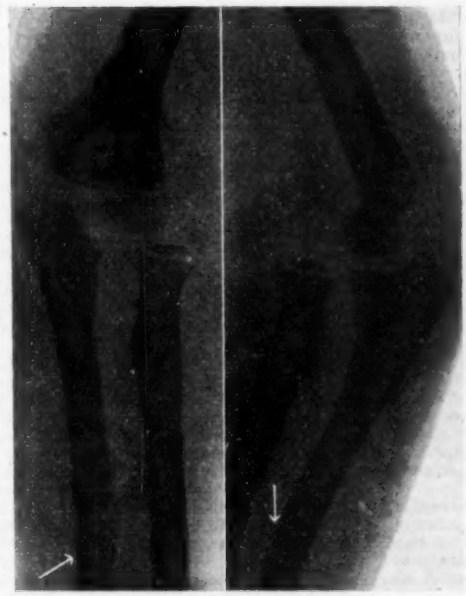

FIG. 1—Case 3. Anterior and lateral views of elbow showing dislocation of head of radius and fracture of shaft of ulna. Arrows in figs. 1, 2, 3 indicate site of fracture of ulna.

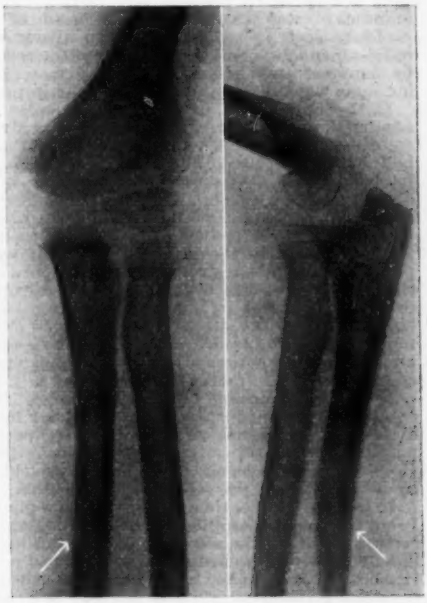

FIG. 2—Case 3. Anterior and lateral views of elbow after reconstruction of orbicular ligament.

CASE 3.—Age 7. Fell on the right arm in June, 1940, and sustained a fracture of the middle of the shaft of the ulna, with anterior dislocation of the head of the radius (fig. 1). At operation on June 18 the anterior approach was used and the torn orbicular ligament was easily demonstrated. The operation described below was carried out. The elbow was immobilised for 4 weeks and then active movement was allowed. After 4 months the patient had a full range of movement, and X rays showed that reduction of the dislocation was stable (fig. 2).

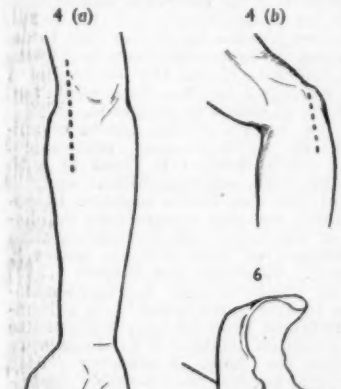

FIG. 4—Right arm. (*a*) Anterior cubital incision. (*b*) Incision on inner side of elbow parallel to posterior border of ulna.
FIG. 6—Head of ulna showing bore-hole.

CASE 4.—Age 14. Accident on July 31, 1940. Dislocation of the head of the radius. Manual reduction was easy but dislocation of the radial head recurred in plaster (fig. 3*a*). Operation as in case 3 was carried out. After 3 weeks' immobilisation the plaster was discarded and a month after that the child had a full range in the elbow and the joint has remained normal since. Fig. 3*b* illustrates the stability of the reconstructed orbicular ligament.

OPERATION

The anterior incision (fig. 4*a*), used in the cases I have described here, was made to the outer side of the antecubital fossa, according to the directions given by Campbell, Corbett and Wilson. In the upper part of the incision the gap between supinator longus on the outer side and brachialis anticus and biceps on the inner side was defined, and these muscles were retracted, the posterior interosseus nerve going with supinator longus. This line of cleavage was carried downwards so that the head of the radius and the inner and upper border of supinator brevis came into view. Small deep retractors were then inserted and the head and neck of the radius, with the torn ends of the orbicular ligament, were defined (fig. 5). A second incision was then made at the inner side of the elbow parallel with the posterior border of the ulna (fig. 4*b*). The ulnar nerve was defined as it comes out of the postcondylar groove and retracted posteriorly, so that the inner surface of the olecranon was available. At the level of the superior radio-ulnar joint a drill hole was then made through the base of the olecranon process, emerging at the lesser sigmoid cavity of the ulna (fig. 6). A loop of kangaroo tendon was then passed around the neck of the radius and both ends threaded through the eye of an aneurysm needle which was passed along the drill channel in the ulna to emerge in the superior radio-ulnar joint. The two ends of kangaroo tendon were then brought out at the inner surface of the ulna and knotted in

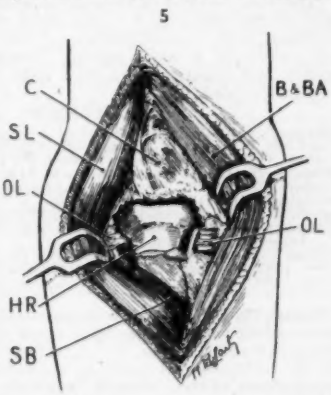

FIG. 5—Operation. C = capitellum covered by capsular ligament; SL = supinator longus; SB = supinator brevis; B and BA = biceps and brachialis anticus; OL = torn ends of orbicular ligament; HR = head of radius.

such a way as to prevent any sliding back. As this manœuvre was carried out the head of the radius could be seen to reduce into both elbow and superior radio-ulnar joints and the stability of the reduction could be demonstrated before the wound was closed. Both incisions were closed and the arm fixed in plaster.

If the importance of the torn orbicular ligament is admitted, rational treatment will obviously aim at its reconstruction. It is remarkable that although Campbell (1929) advised and carried out the procedure here described, books on fractures show a division of opinion about what should be done. Böhler (1935) says that the dislocation is reduced by traction on the forearm with pressure on the head of the radius, and that if this is done early the orbicular ligament will heal and perfect function be restored. Kellogg Speed (1935) notes that reduction is difficult and mentions restoration of the orbicular ligament by a fascial graft passed through a hole drilled in the ulna. Watson-Jones (1940) recommends reduction as described in Böhler's textbook but advises reconstruction of the orbicular ligament in late cases where the fracture of the ulna is malunited or non-united. Wilson (1938) emphasises that in all cases there is a rupture of the orbicular ligament and states that while dislocation is easily reduced by closed manipulation it is impossible to retain the position. He recommends reconstruction of the orbicular ligament by a fascial sling passed through the ulna.

In my experience, though it is easy to replace the radial head by closed manipulation, the displacement always recurs. The reason seems to be the curling up of the ligamentous ends beneath the radial head; in addition the orbicular ligament is usually so much damaged as to make primary repair impossible. It is also evident that the degree of pressure which has necessarily to be kept on the head of the radius while the elbow is fixed in plaster is not safe. Even those surgeons who agree that reconstruction of the orbicular ligament is the only sound method of obtaining success in these cases, differ considerably about the way to achieve it. Hunt's suggestion (1939) of simple suture of the torn ends seems to be a counsel of perfection rarely possible to follow. The same objection holds for Corbett's method of plastic repair with a strip of bicipital fascia; there is not enough of the torn orbicular ligament left, particularly in a small child, for adequate fixation of the repairing strip. Campbell, Wilson and Kellogg Speed all carry out their reconstruction by drilling a hole through the upper end of the ulna. The results in my cases 3 and 4 illustrate the success of this method, and it is probably of little importance what material is used for constructing the new orbicular ligament.

SUMMARY

Four cases of anterior dislocation of the head of the radius, associated with fracture of the shaft of the ulna, are reported.

The best method of treatment seems to be open reduction of the dislocated radial head through an anterior incision, with reconstruction of the orbicular ligament by means of a loop passing round the neck of the radius and secured through a hole drilled in the upper end of the ulna.

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SOCIALIST MEDICAL ASSOCIATION.—A conference on the historical aspects of the medical services will be held at 12, Great Newport Street, London, W.C.2, on Sunday, Nov. 2, at 11 A.M. Mr. H. L. Beales will speak on the social background of the development of the voluntary hospitals in the 18th century, and Dr. T. O. Garland on health problems of the early days of industrialisation. In the afternoon Mr. Arnold Sorsby will open a discussion on the development of organised medicine. Further information may be had from the secretary of the association, 33, Murray Road, Northwood, Middlesex.

SULPHATHIAZOLE IN STAPHYLOCOCCAL LUNG INFECTIONS

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STAPHYLOCOCCAL infection of the lungs is well recognised as a complication of staphylococcal septicæmia and pyæmia. Staphylococcal pneumonia may however have a bronchogenic origin and such cases have particularly been observed during influenzal epidemics (Chickering and Park 1919). In influenzal patients the staphylococcus plays the part of a secondary invader, either alone or in combination with other organisms. Apart from these epidemics, staphylococcal pneumonia does not appear to be common, though occasional reports of its occurrence, particularly in children but also in adults, have been published (Reimann 1933, Macgregor 1936, Everley Jones 1938, Kanof et al. 1939). It is particularly liable to arise in patients whose resistance has been lowered by debilitating conditions.

The pathological features of staphylococcal pneumonia are the development in one or both lungs of one or more areas of massive consolidation showing hæmorrhage and early abscess formation. These abscesses are often multiple. *Staphylococcus pyogenes* can be cultured as the predominant organism from the lungs. Clinically the disease is often characterised by an insidious onset, but it may begin suddenly with chills and rigors. Associated upper respiratory infections are common. Pleuritic pain sometimes occurs. Fever is often high and remittent, with tachycardia, dyspnœa and cyanosis. There is often severe prostration, particularly in children and in influenzal patients. Diarrhœa appears commonly in infants. At first the physical signs are those of bronchopneumonia. Evidence of consolidation may soon develop over one or more lobes. Later the clinical features of lung abscess may manifest themselves. The sputum is purulent and may be bloodstained or rusty and in influenzal cases is sometimes salmon pink. It contains staphylococci, either alone or as the predominant organisms, and is often copious when abscesses have developed. If the patient does not die in the first few days of his illness an empyema commonly develops. Staphylococcal pericarditis and acute nephritis are occasional complications. The disease often lasts as long as a month in cases which recover. The fatality is high, particularly in influenzal and debilitated cases and in children. Thus it was noted by Chickering in the 1918 epidemic that though the staphylococcal cases constituted only about 10% of the total pneumonias they were responsible for approximately half the deaths. Kanof and his colleagues noted a fatality of 73% in his series. Macgregor reported 10 successive cases in children with no recoveries. Reimann, on the other hand, reported 6 patients with only 2 deaths. Leucopenia and high, sustained fever are ill omens in prognosis.

There have been few reports of the results of sulphonamide therapy in staphylococcal pneumonia. Blake and Haviland (1939) treated 6 cases (3 with positive blood-cultures) with sulphapyridine. Only 1 patient recovered and this case had a negative blood-culture. Maxwell (1938) reported a cure with sulphapyridine in a case of staphylococcal septicæmia with pneumonia. The sputum of this patient, however, contained pneumococci. Weisman and Russell (1940) described 5 cases of staphylococcal laryngotracheobronchitis in infants treated successfully with sulphamethylthiazole; 3 required tracheotomy, but despite this measure their condition continued to deteriorate until they were given the drug. Kammerer (1941) mentions a case of staphylococcal postoperative aspiration pneumonia with multiple lung abscesses which was cured after sulphamethylthiazole therapy. In a series of 50 cases of staphylococcal infection treated with sulphathiazole which I reported recently (Melton 1941), I observed that in patients suffering from multiple pyæmic lung abscesses the drug seemed to have little effect, but 4 patients with staphylococcal septicæmia developed pulmonary complications which cleared up satisfactorily. The present report concerns 4 other patients with staphylococcal pulmonary infections, 3 of

bronchogenic origin, who were treated with sulphathiazole.

CASE-REPORTS

CASE 1.—Man of 59. Pneumonia complicated by lung abscesses and empyema. Admitted Feb. 2, 1941, on 4th day of disease, very ill with high fever, dyspnœa and cyanosis. Consolidation in upper- and mid-zones left lung. From 4th to 14th day sulphapyridine, 55 g., given by mouth. Pyrexia less for 2 days only. Consolidation developed in right mid-zone. Between 14th and 17th day pyrexia continued and radiography revealed cavity in left mid-zone. Sputum (8–12 oz. daily) showed predominating growth of *Staph. aureus* as well as some *Streptococcus hæmolyticus*. From 17th to 23rd day sulphathiazole, 36 g., given by mouth; apyrexial after 48 hours and showing much clinical improvement. Right lung cleared satisfactorily, but abscess persisted in left lung. From 28th to 30th day there was further pyrexia reduced by sulphathiazole. Aspiration of sterile, turbid, serous effusion from left pleural cavity carried out on 43rd and 49th days. On 61st day recurrence of pyrexia with acute nephritis. Left pleural effusion now found to give good growth of *Staph. aureus* and moderate growth of *Strep. hæmolyticus*. Blood-urea, 47 mg. per 100 c.cm. After another course of sulphathiazole, patient became apyrexial after 3 days and nephritis cleared up after 5 days. Empyema persisted and intercostal drainage instituted on 66th day. Sulphathiazole concentration in pleural fluid was 8·6 mg. per 100 c.cm. and in blood 15·5 mg. per 100 c.cm. Although dyspnœa and tachycardia improved considerably, empyema cavity remained large and on 94th day rib-resection was done under local anæsthesia and drainage begun. Patient then made a good recovery, empyema cavity closing in and lung abscess no longer being visible radiologically.

CASE 2.—Woman of 62. Staphylococcal pneumonia. Admitted Jan. 31, 1941, on 7th day of illness. Toxic, with consolidation of left lower lobe. From 7th to 15th day sulphapyridine, 48 g., given by mouth. Temperature fell slightly at first but soon rose to higher than before and lung signs persisted. Copious purulent sputum gave good growth of *Staph. aureus*. From 15th to 22nd day sulphathiazole, 80 g., given by mouth. Apyrexial after 4 days; fever recurred on 21st day and 2 oz. of sterile turbid fluid aspirated from left pleural cavity. Permanently apyrexial after 23rd day and lung condition cleared satisfactorily. Radiogram of chest showed no lung abscess.

CASE 3.—Girl of 16. Staphylococcal empyema probably complicating influenzal pneumonia. Admitted Jan. 28, 1941, on 6th day of illness, very ill, pale and toxic with palpable spleen. Signs of right basal pneumonia with pleural effusion. From 6th to 12th day sulphapyridine, 36 g., given by mouth. Further rise in temperature. On 8th day aspiration of sterile serous effusion from right pleural cavity. No tubercle bacilli in sputum. X rays showed opacity right base with doubtful evidence of lung abscess and loculated pleural fluid. On 13th day more turbid fluid aspirated; this grew *Staph. aureus*. From 16th to 20th day sulphathiazole, 36 g., given by mouth; no improvement. Pyrexia continued and was unaffected by further aspirations of the empyema, in which *Staph. aureus* persisted. Sputum showed no staphylococci, but was not examined for these organisms until 18th day. On 21st day rib-resection was done and drainage instituted. Biopsy of pleura showed no evidence of tuberculosis. Gradual improvement followed, patient becoming apyrexial and sinus healing.

CASE 4.—Man of 18. Boil on chin with sterile empyema. Admitted Feb. 7, 1941. Boil for 6 days and left pleuritic pain for 3 days. On admission febrile and toxic. Large furuncle on chin and left pleural effusion, which on aspiration was found to be purulent but sterile on culture. Blood-culture sterile. X rays showed opacity at base of left lung. From 6th to 12th day sulphathiazole, 40 g., given intravenously plus 48 g. by mouth. Further aspirations of pleural fluid on 7th and 8th days showed effusion to be less purulent and still sterile. Sulphathiazole content of pleural fluid 8·9 mg. per 100 c.cm. Drug rash appeared on 12th day. Patient became permanently apyrexial on 13th day, by which time furuncle and lung condition had almost cleared up. *Staph. aureus* cultured from furuncle.

SUMMARY

A group of 4 patients (2 male and 2 female) with staphylococcal pulmonary infections were treated with sulphathiazole; 3 of them had failed to respond to sulphapyridine.

All recovered, though 2 required drainage of empyemas.

I wish to thank Dr. W. Allen Daley, medical officer of health to the London County Council, for permission to treat these cases. The sulphathiazole used in the clinical trials was supplied by Messrs. May and Baker Ltd.

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ACUTE LARYNGITIS COMPLICATED BY RECURRENS PARALYSIS

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THE two cases here recorded, both in soldiers, were seen within a few days of each other during a period when acute upper respiratory infections were fairly common.

CASE 1.—Age 19. Ten weeks before examination had a severe sore throat, followed in a few days by gradual loss of voice. When seen could speak only in a whisper but could make a loud harsh noise when coughing. Throat, nose and pharynx mildly congested. Both antra dim on transillumination, but right antrum washout showed no macroscopic pus. Subacute inflammation of larynx with little muco-pus on right vocal cord. Trachea shared in general inflammation. Right vocal cord showed complete recurrent paralysis, cord being in cadaveric position. Right arytenoid could be moved with a probe.

X-ray appearances of chest normal. No glands palpable in neck. Postnasal swab gave Freidlander's bacillus and pneumococcus on culture; no diphtheria bacilli.

Three days later voice returned gradually, but it had peculiar cracked sound which patient stated was not there prior to illness. Two weeks later voice and appearance of vocal cords, except for gradual subsidence of inflammation, were unchanged.

CASE 2.—Age 38. Twelve days before examination was walking to duty on a bright but cold frosty morning. Had gone only short distance when became aware of slight tickling in throat. This got steadily worse from day to day, until two nights before examination was awakened from sleep by violent fit of coughing. Had several severe paroxysms ending in alarming inspiratory stridor which made him hold on to the bed to get his breath. Paroxysms recurred nightly, most severe being on night before examination. No loss of voice. Looked ill. T. 99° F., P. 100 per min. Nose and pharynx acutely inflamed; pharynx studded with œdematous lymphoid follicles and very sensitive. Small tender gland on left side of neck at level of hyoid bone. Larynx acutely inflamed; vocal cords and mucous membrane bright red. Trachea also inflamed. Left vocal cord showed paralysis in which some adductor movement was still present. Arytenoid mobile. That night had another slight paroxysm of coughing, but improved rapidly with expectorants, inhalations and rest in bed. X-ray appearances of chest normal. Postnasal swab gave few *Staphylococcus aureus*.

Ten days later condition had improved considerably. Paralysis of left cord now complete but laryngitis less inflamed. Voice tired easily and had not improved after a further ten days sick leave. Ten weeks after onset laryngitis had disappeared and paralysed cord had regained considerable range of movement.

The distressing inspiratory stridor experienced was probably due to an abductor paralysis in the early stages.

IN "The Battle of Britain" (Puffin Picture Book, 6*d*.) David Garnett has retold the story of August–October 1940 and James Gardner has illustrated it in colour. The Air Ministry account, on which this is based, must have thrilled every grown person in the country; this will bring in the under-sixteens.

Reviews of Books

Diseases of the Heart

Diagnosis and Treatment. HENRY A. CHRISTIAN, M.D., F.A.C.P., Emeritus Hersey professor of the theory and practice of physic, Harvard University. London: Humphrey Milford, Oxford University Press. Pp. 599. 35*s*.

THE name of H. A. Christian on the title-page of a medical book is sufficient guarantee of its clinical soundness, and this reprint from the "Oxford Monographs on Diagnosis and Treatment" is no exception. Based largely on Dr. Christian's personal experience at the Peter Bent Brigham Hospital and in consulting practice, it presents an able and coherent picture of clinical cardiology. True to his title, he emphasises diagnosis and treatment rather than ætiology, but enough is said to ensure that the reader has some idea of current views on causation. The common conditions met with in practice receive most attention, but rarer conditions are not overlooked and there is a succinct chapter on glycogen disease, amyloidosis of the heart, and other such unusual findings. The references are confined to American literature, and it is good to know that despite the international situation we are still able to receive exports such as this from our American colleagues.

Diabetic Manual

(7th ed.) ELLIOTT P. JOSLIN, M.D. London: Henry Kimpton. Pp. 229. 10*s*. 6*d*.

THE appearance of the seventh edition of this book is a good indication of its popularity on both sides of the Atlantic. In the simplest of language a remarkably complete picture of diabetes mellitus is given to the reader; by the use of homely examples the details of treatment are made clear and the possibilities of misunderstanding are reduced by a series of questions and answers which show real comprehension of the patient's difficulties. But perhaps the greatest virtue of the book lies not in the competence which it displays in setting forth technical knowledge but in its attitude to diabetes as a personal problem. Its whole tone is one of hope; and it would appear impossible for a patient to study this manual without realising that, far from being at the mercy of a mysterious illness, he is in fact master of his own fate.

War-time Health and Democracy

HUGH CLEGG, M.B. Camb., M.R.C.P. London: J. M. Dent and Sons. Pp. 64. 1*s*.

A CHANGE has taken place in the professional attitude to subjects which a few years ago were dismissed almost without discussion. Proposals for state and socialised medicine are receiving a more sympathetic hearing. The war is naturally the precipitating factor in this changed attitude, but wider economic forces have created the possibility of change. That the situation does not affect only a minority is shown by the B.M.A. Planning Commission, which by its very existence has put it on record that somebody should do something. Dr. Clegg sets out to describe how the medical profession met the problems created by September, 1939, how the war affected the national health, and how the health problems which arose have been tackled. He gives a broad survey, well spiced with facts and figures. The title arose out of Lord Hewart's definition of democracy as a system of Government which allows "within agreed limits . . . freedom to criticise"; and the author holds that any system of state medical organisation which shackled this freedom would harm medicine and the people it serves. He points out that after this war the individual doctor will have to work in closer coöperation with his fellow doctors: rapid extension of medical knowledge and techniques compel this. Medical care will have to be administered to the patient by larger medical units, and in these the doctor will have to surrender some of his present freedom of action. "So long as initiative and imaginative thinking are not put into halters by a system that plays for administrative safety, the medical man will gain more than he will lose."

Although the book is written for the general public, it is of considerable interest to the medical reader, who may be slightly startled to see in cold print "No medical service can be other than a repair shop for damaged human machines so long as the people of democratic England live in a state of economic insecurity, are inadequately fed, and are badly housed." Yet Dr. Clegg believes that "the doctor, in relation to his professional work, should steer clear of politics. If after careful investigation he concludes that poverty is the root cause of certain diseases and ill-health, his job is to point this out, in season and out. The cause of poverty is a matter for political thinkers and economists." This seems a somewhat introverted view of the doctor as a democrat. If we have built a state in which poverty breeds ill health we have all had a hand in doing it, doctors and laymen alike; and the duty of undoing it must also be shared. It is not pleasant to picture the medical profession as a sort of encapsulated tumour—benign, no doubt, but cut off from a responsible part in the activities of the body politic.

Periodicity and Cause of Cancer

J. H. DOUGLAS WEBSTER, M.D. Edin., F.R.C.P.E., F.F.R., honorary director, Meyerstein Institute of Radiotherapy, Middlesex Hospital, London. London: Baillière, Tindall and Cox. Pp. 178. 12*s*. 6*d*.

IN following up the experimental observation that periodicity or rhythm in the rate of growth of transplanted tumours is sometimes conspicuous, Dr. Webster has endeavoured to show that similar fluctuation occurs in human cancer. He claims that regular and predictable fluctuations in growth-rate, time of recurrence and metastasis are characteristic of many carcinomas and sarcomas, and also of leukæmias and Hodgkin's disease. The evidence for this claim is set forth in a large number of case-histories, but it is nowhere very clearly stated exactly how the onset of increase or decrease in growth rate is determined nor the date of appearance of a recurrence or metastasis. Dr. Webster appears to depend upon the observations and complaints of the patients; but he claims to find an almost mathematically exact periodicity even with such an erratic source of information, and to have been able to predict the date of onset of a change in growth-rate, a recurrence, or the appearance of metastases in a number of patients. In those cases where predictions were made the patients were told to present themselves for examination at the time the change was due and the author believes the predictions were correct to within a week in 60 cases.

Venereal Diseases

E. T. BURKE, M.B. Glasg., director of L.C.C. Whitechapel clinic. London: H. K. Lewis and Co. Pp. 549. 30*s*.

THIS book is well prepared, well written and well illustrated; it is uncommon to find a textbook on any subject so readable from beginning to end. Much of the teaching is orthodox, but Colonel Burke held some interesting unorthodox views; it is perhaps unfortunate that he used this medium for stating them so strongly. He maintained, for example, that the gonococcus in urethral pus, far from being the intracellular victim of phagocytosis, is attached to the outer wall of the leucocyte and achieves its greatest virulence and most rapid growth in this situation; and he suggested that the gonococcus may be a harmless symbiote, perhaps a normal inhabitant of the genital tract, which becomes pathogenic only on occasions. These are no more than theories; certainly no strong evidence is here produced to support them and they cannot be said to explain the facts even as well as the accepted views.

In the treatment of syphilis he strongly advocated the alternating continuous use of arsenicals and bismuth rather than the concurrent intermittent method which has found greater support in this country. He recommended abnormally heavy doses of arsenicals, given over longer periods than are customary; but the total duration of the treatment advised for early syphilis is shorter than is generally held to be safe. His schemes of treatment have the disadvantage that the patient is required to attend three times a week for most of the period of treatment, and that no bismuth is given for the first three months, during which default is most common. For each preparation of arsenic and bismuth a figure of relative value is worked out, based on the "chemotherapeutic index" or the relationship of the minimum single curative dose to the maximum single tolerated dose. The effectiveness of treatment is

estimated from an equation in which the total "therapeutic units" multiplied by 100 are divided by the number of weeks of treatment, the answer being the so-called "efficiency index." Given that treatment is administered for the number of weeks recommended for the stage of the disease, and an efficiency index of 60 or more, the patient is regarded as having had sufficient treatment. The average clinician may feel rather sceptical of this attempt to estimate the patient's reaction to treatment in terms of a mathematical formula, but the procedure has stood the test of Colonel Burke's experience and so commands respect. It may be questioned whether his classification of the stages of syphilis has much advantage over the Ricordian classification on which fundamentally it is based. Despite these criticisms the book is able and stimulating. It is to be hoped that it will not be allowed to pass into oblivion as a result of the author's untimely death.

Medical Societies

NUTRITION SOCIETY

THE first scientific meeting of the society was held in the Physiological Laboratory, Cambridge, on Oct. 18. Sir CHARLES MARTIN, F.R.S., took the chair at the morning session and Sir JOSEPH BARCROFT, F.R.S., at the afternoon session. In an introductory address, Sir GOWLAND HOPKINS, F.R.S., pointed out that the need for a nutrition society had long been felt. The subject was becoming so large and its implication so wide that it was no longer practicable to consider it as a subsidiary branch of biochemistry or physiology. More important perhaps was the need for closer collaboration between the laboratory worker and the clinician, between the public-health worker and the dietitian, between those concerned with human nutrition and those concerned with animal nutrition. Such coöperation was possible and a society such as this could bring it about. The secretary, Mr. Leslie J. Harris, D.Sc., read messages of goodwill from American nutritional workers and many English societies. The meeting took the form of a symposium on the evaluation of nutritional status. This was discussed under three heads: the assessment of the level of nutrition in man; the clinical signs of dietary deficiency; and the nutrition of farm animals.

ASSESSMENT OF LEVEL OF NUTRITION IN MAN

Dr. HARRIS reviewed the laboratory methods which have recently been evolved for the study of nutritional status in man. There were many reasons, he said, why such tests were of use—they could detect signs of deficiency earlier than was possible by clinical examination; even if no deficiency existed it was often useful to determine whether the reserves of a nutritional factor were high or low; the final symptoms of deficiency (for example, avitaminoses C or K) often occurred so suddenly that it was of considerable advantage to detect the possibility of their approach; lastly, the existence of partial deficiency in itself, while not necessarily causing obvious signs or symptoms, must result in some degree of ill health. Dr. Harris brought forward evidence for the reality of "partial deficiencies." The fact that frank beriberi or scurvy were rare in this country, or even that cursory examination revealed no sign of malnutrition, was not sufficient to prove that partial deficiency did not exist. The standards used in assessing malnutrition were often either inadequate and variable—such as the method of classification of nutritional status in school-children—or were too low, as for example were the past weight and height averages for children. The administration of iron to "normal" babies or of extra milk to "normal" school-children has resulted in considerable improvement in health and physique. He then described the methods which were available for the detection of partial deficiencies of different dietary essentials and gave examples of their use. By the urinary excretion method (the so-called "saturation" test) of measuring vitamin-C reserves it was shown that school-children in a poor district in Cambridge were lower in respect of vitamin-C nutrition than those from a well-run home for waifs and strays where the diet was adequate. The reserves of the vitamin were also found to be higher at the end of the summer than in the early spring. Large groups of children given various graded supplements of vitamin-C showed corresponding graded levels in their "reserves" as measured by this method. Low levels of vitamin C were found in patients with acute infectious diseases, in those on "gastric diets," and in lower economic classes. Tests such as these were being developed also for vitamin B_1 and nicotinic acid, and they offered a reliable method of obtaining exact information about the level of nutrition of individuals or groups of individuals in the community in respect of specific nutrients.

Dr. H. M. SINCLAIR spoke of the necessity for caution in interpreting the results of saturation tests. Alterations in renal threshold, rate of storage or rate of metabolism might conceivably affect the quantity of vitamin excreted in the urine, apart from the degree of saturation of the tissues. The postabsorptive level of a given vitamin in the blood was probably of greatest physiological significance since this determined the amount available to the cell. In attempting to assess accurately the nutritional status of individuals or groups, an exhaustive investigation was essential—clinical, clinico-laboratory and special tests in blood and urine. He gave examples of the methods by which nutrition surveys of this sort were being conducted in America.

Dr. JOHN YUDKIN gave an account of some recent surveys of the incidence of dark adaptation which he had been carrying out in collaboration with Mr. G. W. ROBERTSON, B.Sc. Poor dark adaptation in single individuals may be proved to be due to deficiency in vitamin A by the improvement which occurs when the vitamin is given. In comparing large groups of people, however, a comparison of the proportion in each group whose dark adaptation is good, bad or indifferent is sufficient to show the relative status of these groups as regards vitamin-A intake. Thus, in a study carried out in children from three Cambridgeshire schools, 60% of the children from two of the schools, and only 35% from the third school, were classed as having good dark adaptation. In adults, it is necessary to compare groups of similar age since there is a deterioration of dark adaptation with age. In three groups of young people below the age of 22, two of them—nurses and medical students—showed 80–90% who had good dark adaptation, while the third—workers in a Midland factory—contained only 55% in this grade. The factory workers were also examined as to their hæmoglobin levels. Nearly 800 subjects were investigated; more than 30% of the women and some 6% of the men had definite nutritional anæmia.

CLINICAL SIGNS OF DIETARY DEFICIENCY

Dr. B. S. PLATT stressed the point that the nutritional level at which clinical symptoms appeared was definitely lower than that at which optimal health is maintained. The detection of deficiency diseases rested not only on accurate examination but also on the response to specific therapy or on the improvement following a generally increased standard of nutrition. Illustrating his remarks with photographs, Dr. Platt pointed out some of the features of deficiency diseases as seen by him in China and Africa. In some instances the introduction of some simple dietary measure produced impressive results. The change, for example, to unwashed from washed rice in certain factories in Shanghai led to a considerable fall in the number of employees who had to give up their work. Dr. Platt emphasised the association between deficiency and infection. He referred also to the high incidence of infestation with the bed-bug found in people suffering from cheilosis. Finally, a great deal might be learned from the study of the general behaviour of subjects: the apathy and listlessness found in malnourished children contrasted greatly with the exuberance and high spirits of their better nourished neighbours.

Dr. R. H. DOBBS dealt with the assessment of the nutritional status of children. Adequate assessment must be made on the basis of physical examination, general behaviour (particularly as described by the mother and teacher) and the existence of special evidence of malnutrition. Of particular value in the physical examination was the condition of the skin, the musculature (including stance and posture) and the teeth. Apathetic behaviour, poor appetite and undue fatigu-

ability would affect school progress and afforded a guide to general ill-feeding. Malnutrition might also be suspected from "external evidence" such as the family income or a history of artificial feeding without due care to supplement the diet with, for example, iron in one or other form. Conditions of stress were important in accentuating the effects of defective nutrition. Growth in childhood provided such stress and infection increased it, making it all the more important to assure the adequate nutrition of the child.

The question of physiological stress was underlined by Dr. W. C. W. NIXON. The increased demands of the body during pregnancy might well be sufficient to reveal a border-line state of deficiency. In Hong-Kong, beriberi frequently made its appearance during the latter half of pregnancy. Vomiting in the early stages might increase the deficiency of vitamin B_1. Such mild and often neglected complications of pregnancy as œdema and pins-and-needles might well be due to mild deficiency of this vitamin. Many women dying of beriberi during pregnancy had had œdema for a month or two before the diagnosis was obvious. Recalling the incidence during pregnancy of dental caries, anæmias, cramps, œdema, fatigue and pins-and-needles, Dr. Nixon asked whether, in the light of newer nutritional knowledge, it was not more likely that they were all signs of inadequate nutrition rather than necessary physiological concomitants of the pregnancy state.

NUTRITION OF FARM ANIMALS

Mr. C. CROWTHER, Ph.D., began by comparing the problems of animal nutrition with those of humans. The nutrition of farm animals was concerned chiefly with attaining as economically as possible a specific product. This did not necessarily involve the optimal nutrition of the animal and indeed might intentionally produce a pathological state. The worker in animal nutrition had many advantages over his colleagues studying human nutrition. His subjects offered a much greater freedom in experimentation, were more passive and hence less likely to interfere in the experiments, and lastly were much more uniform as regards genetic constitution. On the other hand, in determining the adequacy of an animal diet it was difficult to assess the quantity of available carbohydrate since cellulose was in part assimilable. The problem of the protein, too, was complicated in ruminants by the bacterial synthesis of non-protein nitrogen into amino-acids. The calculation of the energy value of the diet was also more involved than with human diets. The problem of supplying specific sources of vitamins did not often arise in the nutrition of the farm animal, especially when grazing. In considering the effects of such supplements, it was necessary to bear in mind the other constituents of the diet, since their effects were often more than simply additive.

Mr. H. H. GREEN, D.Sc., reviewed some of the commoner deficiency diseases of animals. Vitamin deficiencies were not common except in animals intensively reared in stables, batteries or styes. In such conditions, deficiency of vitamin D might occur in poultry and of nicotinic acid in pigs. Mineral deficiencies, on the other hand, were not uncommon. Aphosphorosis, for example, was well known in South Africa. Deficiency of the trace elements—copper, cobalt and possibly manganese—also occurred. Swayback disease amongst lambs appeared to be due to deficiency of copper, and possibly also of cobalt.

Mr. JOHN HAMMOND, D.Sc., F.R.S., discussed the question of the total energy and protein of the diet. Animals kept on a low plane of nutrition for a short while after birth are not only smaller than normal at the end of this period but go on being small into adult life. The weight of animals fed for long periods on a low plane of nutrition may be less than half that of litter mates receiving a larger amount of food. Not only the size of the body but also the relative proportions of the different parts are greatly affected by controlling the food intake at different levels. These effects, too, produced in young animals, may persist to adult life even if the diet has subsequently been increased.

DISCUSSION

Prof. J. L. MAXWELL, M.D., stressed the importance of detecting early signs of deficiency. He suggested that pain in the back and legs, and instability in walking often occurring in pregnancy were possibly early signs of vitamin-D deficiency. It was necessary also to bear in mind that deficiencies were likely to be multiple rather than single.

Prof. E.-J. BIGWOOD said night-blindness in Austria in 1918 appeared first in pregnant women, another example of the effect of pregnancy revealing a latent deficiency. In a prisoners' camp in Germany the Russians developed scurvy and the Rumanians developed pellagra although all were given the same deficient diet. With regard to the question of saturation with a factor such as vitamin C, it had often been asked whether this was necessarily identical with the optimal intake. If guineapigs, one of the few species of animals which can develop scurvy, are allowed a free choice of diet they become saturated with vitamin C. Moreover, the amount of the vitamin in the blood reaches the same level as that of other species of animals in whom scurvy cannot be produced but for whom nature synthesises the requisite vitamin C.

Dr. DAGMAR WILSON appealed for the standardisation of the signs of early deficiency so that workers could be trained, as in India, to recognise them easily. She had been able to recognise several cases of angular stomatitis in Oxfordshire school-children.

Mr. GEOFFREY BOURNE, D.Sc., pointed out that among the early signs of vitamin-B_1 deficiency were increased irritability, lassitude and a general deterioration in mental alertness. In the detection of early deficiency he had found the Göthlin test for capillary fragility of use in showing a lowered intake of vitamin C in patients with peptic ulcer.

Mr. S. K. KON, D.Sc., suggested that a further test for malnutrition was the estimation of vitamins in the milk of nursing mothers. Tests already begun showed that there was a considerable drain on the vitamin-A reserves of the mother and that the amount of vitamin C is now considerably lower than that found in 1934 by Dr. Harris.

Prof. H. D. KAY, D.Sc., said that although, as Dr. Crowther had pointed out, the provision of extra supplies of vitamins was not perhaps essential for all classes of farm animals, it would considerably affect the nutritive value of the animal product as far as their use in human nutrition was concerned. Thus, the amount of vitamin A in milk was dependent to a very large extent on the amount ingested by the cow.

Prof. OTTO KESTNER recalled some of his work on protein deficiency in Germany in the last war. He also pointed out that while vegetable proteins might singly be of low biological value, together they might act complementarily so that defects in one might be made good by another.

Dr. S. W. SWINDELLS hoped that one of the objects of the new society would be to disseminate accurate knowledge of nutrition.

Dr. E. H. WILKINS looked forward to the adoption of simple tests for malnutrition and mild deficiencies which would be easily applicable by medical officers of health. He instanced the importance of a study of posture in children as a guide to nutritional status.

Dr. ROBERT SUTHERLAND wished to see emphasised aspects of nutrition which would lead to the adoption of generally satisfactory diets, rather than those which led to the development of studies of deficiency diseases, their assessment and their specific cure.

Sir JOSEPH BARCROFT, referring to the present status of laboratory methods in the diagnosis of deficiency disease, recalled the similar position which arose after the introduction of such diagnostic aids as the electrocardiogram by Mackenzie and Lewis. Clinicians were at first sceptical as to their usefulness, but this was mainly because the apparatus was costly and the technique specialised. He felt that laboratory methods in the study of malnutrition would soon reach a state of recognition and applicability comparable to that enjoyed today by the technical methods used in cardiology. As far as the question of the separate study of the various nutritive factors was concerned, he felt no apprehension that this would detract from a proper study of malnutrition as a whole. He looked forward to the time when we knew enough about nutrition to construct a completely synthetic diet.

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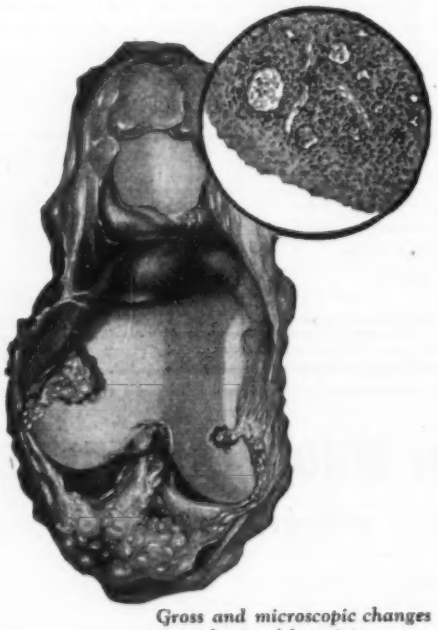

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THE LANCET

LONDON: SATURDAY, NOVEMBER 1, 1941

NATIONAL WAR FORMULARY

THERE was a time when a doctor could achieve a fair reputation as a prescriber by the liberal use of pharmaceutical cocktails such as the compound tincture of cardamon, and by avoiding the more spectacular catastrophes of incompatibility represented by explosive mixtures. The advent of national health insurance, by curbing extravagant prescribing, showed many practitioners the error of their ways, and not a few physicians were content to hang the blunderbuss in the hall and practise polypharmacy no more. Modern war, which is fought as savagely in the realm of economics as on the battlefield, has now forced all doctors to exercise more discrimination when prescribing. The therapeutic requirements committee of the Medical Research Council stated the position succinctly in their memorandum [1]: "Economy in the use of a drug may be necessary in war-time because the drug is imported or because its manufacture at home diverts materials and skill from other essential services." The committee classified drugs into those which we can or must use freely (A), those with which we must be careful (B), and those which we must give up altogether (C). Based mainly on this classification a National War Formulary [2] will shortly be issued by the Ministry of Health, and its importance can hardly be overstated. The general practitioner is specially concerned, for the N.W.F. will replace the National Formulary for N.H.I. purposes on Dec. 1, before which date all insurance practitioners and pharmacists will receive a copy. But the new formulary is not intended exclusively for N.H.I. patients, as its children's section bears witness; it is hoped that all practitioners will familiarise themselves with the N.W.F. and use it when prescribing for their private and hospital patients as well.

Comparatively few doctors are sufficiently well informed on the dry bones of materia medica to appreciate the more subtle reasons for avoiding this or that drug as a contribution to the war effort. They will therefore be glad to have the guidance of the section on war-time prescribing. The reasons for some of the "Don'ts" are at once apparent, particularly those referring to confections, glycerin and alcohol. On the other hand, it will come as a surprise to many that they must go carefully with such commonplace substances as linseed, starch and soap liniment (high alcohol content). We referred last week (p. 489) to the urgent need for economy in aspirin, and this is mentioned in the formulary, though it includes mixtures and tablets containing aspirin. If the results of recent research [3] are accepted, it follows that five grains of aspirin have as powerful an analgesic action as ten. There seems therefore to be no pharmacological justification for the practice (as common among doctors as laymen) of taking "a couple of aspirins"; the essential thing is that the dose should be absorbed, by grinding it up, chewing it or taking it in suspension. There are some helpful remarks on proprietary preparations, the abuse of which has become the blight of modern therapy. To quote the formulary: "Before prescribing any proprietary preparation the medical practitioner should consider carefully whether the needs of the patient would not adequately be met by the use of a drug or preparation which is identical or of reputed analogous therapeutic effect. Particularly should he refrain from prescribing proprietary preparations of foreign origin." Because of skilful publicity and their convenience these preparations tend to accumulate in the doctor's therapeutic armamentarium, and the prescriber is likely to continue to use the original trade-name long after the identical substance has become official—usually under a name which has some bearing on its composition but not necessarily easier to remember on that account. There can now be no excuse for such extravagance.

In this country we are well supplied with works of reference on materia medica, but our B.P., our B.P.C. and our Martindale tell us little about the relative effectiveness, availability and cost of the preparations they describe. Sweet indeed are the uses of adversity which has compelled a committee of distinguished medical men and pharmacists to come to grips with these aspects of prescribing. The advice which the N.W.F. offers has been made necessary by the difficulties of supply, but there has clearly been a careful search among pharmacological title-deeds in deciding the claims of each drug. Exception can be taken to few of the successful candidates, though it is difficult to justify the inclusion of opium in a lotion; the addition of sodium bromide to the sleeping draught containing chloral hydrate merely spoils the end-point of the latter drug; and mist. brom. et arsen. is based on the long-exploded belief that a small dose of Fowler's solution prevents bromism. There is a welcome departure from the so-called classical prescription, with its tiresome insistence on basis, adjuvant, corrective and vehicle; and there is evidence of a determined effort to eliminate superfluities and go straight to the point. A diagnosis having been made and drug treatment decided on, this booklet shows how simple it is to prescribe for the patient. The legacy of elaborate polypharmacy bequeathed to us has here been decisively repudiated; let us hope that this wholesome decision, forced on us by the war, will remain ours by choice with the return of peace.

1. Economy in the Use of Drugs in War-time. M.R.C. War Memorandum No. 3, 1941, p. 3.
2. H.M. Stationery Office. Pp. 70. 6*d*.
3. See *Lancet*, 1941, **1**, 483.

INSUFFLATION OF THE FALLOPIAN TUBES

SINCE the procedure was first described by RUBIN in 1920 insufflation of the fallopian tubes has been largely practised by gynæcologists in this country, and various modifications of RUBIN'S original apparatus have been made, notably those of BONNEY and PROVIS. This minor operation, however, largely because of its simplicity, is sometimes misapplied. KING,[1] who surveys his results in 635 insufflations, sets up six indications for insufflation—as part of a routine investigation in cases of primary and secondary sterility; as a help in the differential diagnosis in obscure pelvic conditions; to determine the state of the residual tube after salpingectomy for any reason;

1. King, G. *Caduceus*, 1930, **19**, 161.

to confirm the success of a sterilising operation; as a routine after salpingostomy or uterotubal implantation; and as a therapeutic measure in maintaining or improving tubal patency. His four contra-indications should be noted. First and foremost is menstruation or any other type of uterine bleeding. The only proper time to perform insufflation is in the week succeeding menstruation; if this rule is broken safety is sacrificed and the test is vitiated. Yet how many hospital insufflations are done haphazard at any time in the intermenstrual phase? Secondly, any acute or subacute pelvic inflammation, notably cervicitis, for here the danger of retrograde infection is very real. The third and fourth—pregnancy and severe constitutional disease—are self-evident.

KING'S technique differs from the accepted practice in several important points, the most striking being that he eschews special preparation and anæsthesia and performs his insufflation in the outpatient clinic. This alone saves patient, surgeon and institution much time and money and his results and those of American gynæcologists conclusively prove the safety and efficacy of the proceeding. A careful bimanual examination is made to rule out any pelvic contra-indication. The patient is then placed in the lithotomy position, suitably draped, and the vagina, cervix and cervical canal are carefully cleansed with an antiseptic such as 5% mercurochrome or Dettol. A uterine sound is passed after gently grasping the cervix with a fine volsellum, and this gives minimal discomfort to all but the most nervous patients. A special uterine cannula with a gas-tight joint at the cervix is inserted and an assistant turns on the gas. KING uses carbon dioxide and limits himself to a flow of 30–60 c.cm. per minute, and this in normal cases should be all that is necessary to demonstrate patency; he never exceeds a pressure of 200 mm. of mercury. The apparatus is so connected that the behaviour of the tubes is recorded permanently on a kymograph. While the investigation is proceeding the assistant auscultates both iliac regions for the intra-abdominal passage of gas, while the operator sees that no leakage takes place at the cervix, watches the recording needle and keeps an eye on the patient. The resultant graph will divide patients into four main types: normal patency, tubal spasm, tubal stenosis and complete tubal obstruction. In cases of normal patency, and these comprised 50% of KING'S series, gas passed at a pressure of under 100 mm. and well-marked oscillations at the rate of 3–5 per minute were recorded on the kymograph, due to normal tubal peristalsis. The presence of these waves, which increase in frequency and vigour as the time of ovulation approaches, establishes normal behaviour of the tubal musculature beyond doubt. The graph obtained with one patent tube is no different from that with both patent; hence the importance of auscultation on each side of the abdomen. KING only encountered tubal spasm in 3·5% of his series, and this figure agrees closely with that of RUBIN. Here the gas does not pass until a high pressure is reached, sometimes approaching 200 mm. of mercury. Thereafter it passes readily and the graph then obtained differs in no way from that of a tube of normal patency. It is doubtful whether any clinical importance is to be attached to tubal spasm, and to overcome this some workers give a routine dose of atropine before examination.

In cases of tubal stenosis, where inflammation has thickened and fibrosed the tubal wall with formation of strictures or kinks, with or without peritubal adhesions, the kymograph will show absence or great impairment of peristaltic activity. This occurred in 12·5% of KING'S series, and he rightly points out that in this class of case Lipiodol injection will give a normal picture, yet this is the very tube that is most likely to be associated with sterility, since though patent it is largely functionless or subfunctional. Insufflation in these cases is often painful, probably from the stretching of adhesions, whereas in normal patency it is as a rule painless. Tubal obstruction was encountered in 34% of KING'S cases, a figure which again agrees with that of RUBIN. Such an obstruction may occur at the cornu, in the tube, or at the abdominal ostium. If at the cornu no gas passes, of course, and the patient experiences a midline pain of uterine distension. If the obstruction is at the abdominal ostium the pain may be referred to one or other iliac fossa. The graph obtained in tubal obstruction is characteristic, with a flat plateau at or near 200 mm. Hg, which is sustained until the gas pressure is released. Certain symptoms may be experienced by the patient during the test. There may be slight pain as the uterus and tubes are distended with gas, passing off as the gas enters the peritoneum; more severe central lower abdominal pain or iliac-fossa pain usually indicates a blockage at the cornu or the abdominal ostium respectively. Any severe pain is a signal to stop the examination. Shoulder pain is diagnostic of pneumoperitoneum and thus of tubal patency. It was noticed by KING in 157 patients, especially when they assumed the standing position at the conclusion of the examination; it was invariably slight and transitory, and often not remarked on unless a special question was put. In all cases of patency an X-ray or screen examination will reveal gas under the diaphragm.

Certain dangerous sequelæ occurred in 17 of KING'S cases. Many of them were mild, such as nausea in 5 cases, vertigo in 3, fainting in 1 and a hysterical attack in 1. In 5 cases there was severe pain, probably due to the presence of hydrosalpinx, which is naturally a contra-indication to insufflation. There were 2 cases of suspected gas embolism, a danger which has been used as an argument against insufflation. Both of these patients quickly recovered. In the first a pressure of 200 mm. Hg was used and on rising she complained of malaise and precordial pain and started to cough violently, producing a moderate amount of blood-stained frothy sputum. She had a rapid pulse and was cyanosed. After 20 minutes these symptoms passed and after resting another 20 minutes she was allowed up and felt well. A tentative diagnosis of gas embolism of the utero-ovarian veins was made. The second case was similar except that the patient had a slow pulse of 40; she recovered in 4 hours. Both these patients had blocked tubes and both were insufflated rather late in the cycle, on the 11th and 16th day. The lessons to be learned from them are that in tubal stenosis prolonged insufflation is dangerous and the amount of gas used should not exceed 50–75 c.cm. If any unusual symptoms arise during the test it should be stopped at once. If the operator is alive to the dangers and contra-indications there is no reason why these unpleasant reactions should deter him from its performance. The dangers

of gas embolism are much less in the conscious than the anæsthetised patient, for the diagnosis is immediate in the one and masked in the other. On the therapeutic value of insufflation KING is wisely guarded. RUBIN claimed that 17·5% of his sterility cases became pregnant after the operation, and nearly half of these in under two months, an observation confirmed by many subsequent writers. Such a result is more empirical than scientific yet the figures are impressive. The conclusion must be that insufflation is a useful procedure, that it should be carried out as an outpatient rather than an inpatient operation, that a kymographic apparatus gives the best and only certain evidence of the functional behaviour of the tubes, and that if due regard is paid to the indications and the danger signals it is safe.

THE MENTAL HOSPITAL PICTURE

IT is not perhaps generally realised how great a contribution the mental hospitals of the country have made to the Emergency Medical Service. Large numbers of beds had to be found at the outbreak of war, and a considerable proportion of them were provided by the mental hospitals, some of which were emptied for the purpose, while others renounced treasured new blocks or sizeable annexes. Most of the big mental hospitals have given up a quarter of their beds. This meant that patients had sometimes to be overcrowded. Moreover, shortage of nursing and medical staff, darkening of wards by protective blast walls and blackout curtains, and other unavoidable war restrictions have impaired standards in treatment and living conditions. At one large hospital, for example, a modern block for newly admitted cases and a newly opened villa for convalescent patients were vacated and handed over to the E.M.S., to provide 250 casualty beds and a nurses' hostel. Thereafter treatment of early mental cases had to be carried on in the wards of the old hospital, where grading and segregation were difficult. In this hospital, as elsewhere in the country, the number of voluntary patients admitted has fallen, but the reduction does not indicate that facilities for the treatment of such patients have been seriously limited; certainly in the London area not a single application for voluntary treatment has been refused through lack of accommodation. Taking the country as a whole, 100 admissions are made up of 40–60 certified, 10–12 temporary and 30–40 voluntary patients. The falling off in total admissions that has been reported reflects the common experience that war does not increase the incidence of psychosis and neurosis. In London the drop in new admissions has been far greater than it was in the last war, probably owing to evacuation. Nevertheless, in some areas, patients who for social reasons ought to be in a mental hospital are not being accepted, or are being discharged, because medical superintendents say quite fairly that they must keep their accommodation for the acuter cases. These less acute patients may be found causing mild difficulty in their homes or in reception areas by behaviour which would not be tolerated in peace-time. On the other hand, many patients of both sexes with relatively mild mental and emotional disorders are being absorbed into regular employment, and are finding occupational therapy in jobs for which in peace-time they would never be taken on; and perhaps in time to come we shall have to plan the rehabilitation of psychopathic people on the lines thus artificially produced by war. It is possible, of course, that more patients who would normally seek treatment as voluntary cases in hospital are being seen and treated at outpatient clinics, of which there are 203 distributed over the United Kingdom and Northern Ireland; but no such increase has been reported. Indeed, in many of the clinics situated in large cities there has been a decided falling off in attendances as a result of evacuation. In general the position is that the mental hospitals, though hampered by the sacrifice of accommodation which has been made to the E.M.S., by shortage of doctors, and even more serious shortage of nurses are standing up bravely to their job, and deserve much credit for maintaining a vital social service approximating to peace-time standards under heavy difficulties.

SCHOOL MEALS

OF the five million children in our elementary and secondary schools only 300,000 are now getting a meal at school; and, while in some areas school meals are provided for a third of the children, in others there is no provision at all. In the reception areas children often have to travel several miles to school with no chance of returning to their temporary homes for a midday meal; if there is no meal at school they have to subsist on frugal packet lunches put up by harassed foster parents. These nosebags were inadequate in peace-time and must be more so now when cheese and meat are scarce, foreign fruit has disappeared and home-grown substitutes are expensive. Moreover, with the vastly increased employment of women in munitions there is often no-one to prepare meals at home and supervise their consumption. As speakers in the Women's Parliament pointed out in their session reported on another page, universal school meals would not only be a great step towards ensuring adequate nutrition of our children, but would also release more women for industry than any other measure. In the House of Lords on Oct. 21 Lord WOOLTON foreshadowed a rapid expansion in school-meal organisation. The Exchequer is greasing the ways with an additional grant of 10% towards their cost, making the average rate of grant 80%, and school canteens are to receive priority supplies of food. The cooking depots which local authorities have been holding in readiness for feeding the community if communications or normal domestic arrangements were put out of action are to be adapted for the children, and the British Restaurants are also to help with cooking school meals. Where new kitchens must be started local authorities will be able to draw on the Ministry of Food's central pool for their equipment.

These steps are encouraging, but as the *Times* pointed out in a leading article on the morning of Lord WOOLTON'S announcement it will hardly be possible to provide a midday meal for all school-children in war-time unless some English variant of the Oslo meal is adopted. This has already been attempted successfully in the East End of London, in Glossop and elsewhere. The theoretical principle behind the Oslo meal is that if at one meal in the day highly protective foods, chosen from dairy foods, greengroceries, the oily fish and whole cereals, are given it will not matter much what foods are chosen by the child's parents for the rest of the day. The

Norwegian public-health services, on the advice of Prof. CARL SCHIÖTZ, chose milk (about ⅔ pint), half an orange, hard rye bread with butter and cheese, wholemeal bread and butter, and a whey cheese or cod-liver paste. The meal was finished off with half an apple or a raw carrot. This meal is highly protective, giving satisfactory amounts of calcium and iron and vitamins A, B, C and D. It is easy to prepare and demands no cooking, so that kitchens and dining-hall can be largely dispensed with.

If the authorities could be induced to envisage anything but the hot cooked meal as essential in feeding the young we should have gone a long way towards solving the problem of safeguarding the health of the school-child, for this Oslo meal is a better safeguard than the ordinary hot meal. There would remain the resistance of school-teachers and parents, for the children, conservative as they often are as regards the contents of cooked meals, usually take to an Oslo meal. The staff have "never heard of such a meal" and the parents are apt to feel that their children are being defrauded by being given cold uncooked foods. That this kind of meal solves the problem of inadequate equipment is clear from the experience of domestic-science teachers who have been allowed to introduce a meal of the Oslo type because the demand for school meals had outrun the school equipment. In one such school the Oslo meal largely invaded the province of the cooked meal. English variants are not hard to devise. The milk should be the same in each meal, though there is no objection to giving it hot or flavoured with cocoa or coffee if it is thought essential that some hot food should be served. Wholemeal bread could take the place of the *Knackebrod*, and vitaminised margarine the place of butter. Apples and raw carrots are still available. The main problem lies in supplying what the half orange, the cheese, and the cod-liver paste supply. If oranges are unobtainable, watercress, mustard and cress, and raw turnip or swede will take their place, or sandwiches with fillings of chopped raw cabbage and parsley may be used. The cheese and cod-liver paste supply calcium and vitamin D, but these could as well be obtained from fresh herrings and sprats, or more simply from tinned herrings and salmon, and there should be no difficulty with the simplest of appliances in converting them into a paste to spread on bread. If we wish to imitate the Norwegians in giving a teaspoonful of cod-liver oil daily throughout the winter this can be incorporated in the fish paste. In the *Times* of Oct. 11 the director-general of Norwegian health services says that the significance of a hot meal has been overestimated, and it seems that all the benefits of hot food, with some others, can be obtained from a cold meal with a hot drink. This looks like being the way in which school meals for all can be achieved. All that is now required is imagination and the dropping of our British resistance to the unusual in catering.

Annotations

BLACKWATER FEVER

THE cause of the paroxysmal hæmoglobinuria which gives blackwater fever its name has long been disputed. It is known to be associated with malaria, although parasites may not be found in the patient's blood. Is there a specific strain of parasites which is specially liable to cause hæmolysis of red blood-cells in excessively large quantities? Do patients have hæmoglobinuria because their red cells, possibly from long exposure to malarial attacks, are exceptionally liable to hæmolysis? Is there a hæmolysin in the patient's blood responsible for the destruction of the red cells? Foy and his co-workers[1] have tried to answer these questions by studying the results of injecting blood from blackwater-fever patients into unaffected people, and conversely by transfusing normal blood into blackwater-fever patients. The results in one woman are presented in detail. This was a typical case with black, acid urine containing oxyhæmoglobin and methæmoglobin, and with methæmalbumin in the blood-plasma; no malarial parasites were found in her blood. Twenty-five c.cm. of this patient's blood was injected intravenously into a normal healthy man. Eleven days later, although he had been kept strictly away from possible outside infection, the man developed a typical malarial attack and *Plasmodium falciparum* rings were found in thick films of his blood, but he did not develop hæmoglobinuria. This confirmed Foy's previous experience with a series of 106 lunatics who were given intramuscular injections of blood from blackwater-fever patients; several of the recipients developed malaria, but none showed hæmoglobinuria. From these results he concluded that there is no specific hæmolysing strain of malarial parasites. The patient herself was given three blood-transfusions from three different normal donors, and although these raised the red-cell count at first it was soon reduced to its former level, the hæmolysis continuing unabated. From this it is concluded that normal cells are just as liable to hæmolysis in a blackwater-fever patient's blood-stream as are the patient's own cells. At the time of the transfusions the patient's reticulocyte count was low and the rise and fall of the red-cell count seemed definitely related to the effect of the transfusions and subsequent hæmolysis; later, when the reticulocytes rose, recovery set in. Foy therefore infers that a circulating hæmolysin is the active factor that produces the intense hæmolysis of blackwater fever. The fact that no recipient of blackwater-fever blood developed hæmoglobinuria he attributes to insufficient dosage or immediate neutralisation of the hæmolysin. This research has certainly cleared the ground and it is interesting that, like other workers on paroxysmal hæmoglobinurias,[2] his final conclusion points to a hæmolysin. So far, however, the hæmolysin remains theoretical—its presence has yet to be firmly demonstrated. Fairley, also working on this point, thinks that it is an intracellular lysin and cannot be detected by ordinary means. Whatever the final answer, it is clear that the information obtainable from studies of blackwater fever can usefully be applied to hæmolytic disease in general.

1. Foy, H., Kondi, A. and Moumjidis, A. *Trans. R. Soc. trop. Med. Hyg.* 1941, **35**, 119.

SULPHONAMIDES AND TISSUE-DAMAGE

REPORTS from various sources have so far indicated that the local use of sulphonamides in the treatment of wounds has little or no damaging effect upon the tissues. The brain tolerates powdered sulphanilamide and sulphapyridine surprisingly well, as Russell and Falconer[3] demonstrated, and this might be regarded as a fairly severe test. On the other hand Bricker and Graham[4] have found that the oral administration of sulphanilamide to dogs with experimental wounds seems seriously to inhibit the fibroblastic response. On the strength of this Glynn[5] has investigated in rabbits the local effects of sulphanilamide, sulphathiazole and sulphapyridine on the development of granulation tissue

2. *Lancet*, May 24, 1941, p. 667.
3. Russell, D. S. and Falconer, M. A. *Lancet*, 1940, **2**, 100.
4. Bricker, E. M. and Graham, E. A. *J. Amer. med. Ass.* 1939, **112**, 2593.
5. Glynn, L. E. *J. Path. Bact.* 1941, **53**, 183.

in experimental wounds. A disc of rabbit blood-clot was introduced into a pocket made between the dense fibrous layer deep to the platysma and a similar sheet covering the deep musculature of the haunch on either side. On one side 0·25 g. of the drug was also inserted. Sections of the wounds were examined at various stages of healing up to 2 weeks. Glynn found no histological evidence that any of the three sulphonamides inhibited the formation of collagen or pre-collagen fibres, or the development of new blood-vessels. The macrophage response likewise did not seem to be impaired, though there was evidence of diminished phagocytosis in the treated wounds. Sulphathiazole and sulphapyridine persisted in crystalline form up to 5 and 7 days respectively but the sulphanilamide was completely dissolved within 24 hours. An attempt was also made to estimate the quantitative effects of these sulphonamides by fibroblast counts at 5, 7 and 14 days. With sulphanilamide no significant difference was found on comparing the treated wounds with their controls; a very slight inhibition of fibroblast proliferation could be attributed to sulphapyridine and sulphathiazole. On the other hand, sulphanilamide was found to have a slight but definite toxic action on striped muscle. Sulphapyridine had a still slighter action while sulphathiazole had none. It may thus be concluded that, while it is safe to use all three drugs in the local treatment of wounds, it would be preferable to use sulphathiazole for wounds of the face, hands and forearms where the minimum of scarring is desirable.

MUSCLE ATROPHY

THE reaction of a muscle to the severance of its nerve is as a rule divided into three phases. In the first period, lasting about a week, there are few changes in the muscle, morphologically or chemically. But the emergence of slow contraction and rising chronaxie at the end of the first week indicate that important changes are then taking place. The beginning of the second phase is characterised by the onset of spontaneous rhythmical contractions—fibrillation—which can be seen in the exposed muscle or where the cover is thin—e.g., in the tongue by the reflected light. A more delicate method for detecting, and for recording, fibrillation is the electromyogram, as Denny-Brown and Pennybacker[1] have shown. At the same time as the fibrillation starts, there begins a rapid progressive atrophy of the muscle, demonstrable in the reduction of its volume and weight. The transition to the third phase is gradual; when the cross-striped substance disappears and the interstitial fibrous tissue proliferates the fibrillation ceases, and the muscle is gradually converted into a non-excitable and non-contractile tissue, histologically something intermediate between scar tissue and tendon.

How does the fibrillation originate, and what has it to do with the atrophy? The first question is not definitely solved yet. But it is known that the onset of fibrillation coincides with an increase of the susceptibility of the muscle to acetylcholine, and therefore Denny-Brown and Pennybacker assumed that the fibrillation of the muscle undergoing atrophy after denervation is due to excitation of each muscle-fibre by the small amount of acetylcholine circulating in the blood. This has been questioned by Eccles,[2] who found that curare depresses the sensitivity of the denervated muscle to acetylcholine without affecting the fibrillation. J. N. Langley was inclined to believe that the fibrillation took precedence over the atrophy, in other words that the atrophy was not one of disuse but one of fatigue or exhaustion; "the muscle inadequately protected by its refractory period, driven even to the utilisation of its own material," as Tower[3] puts it. The evidence for this assumption being far from satisfactory, Solandt and Magladery[4] studied the subject experimentally. They established the weight-loss curve of rat muscles after denervation, and demonstrated the presence of fibrillation by recorded action potentials. They then prevented fibrillation in some of their muscle preparations by giving various drugs, of which quinine and quinidine were the most effective. Atrophy still developed in all these preparations, though they had never exhibited fibrillation as detected by the electrical method; hence it was concluded that the atrophy of denervation is not due to the fibrillary activity. However, the weight loss in the animals given quinidine was not quite as great as in the controls. This is attributed to the fact that the quinidine induced a lethargic condition which rested the denervated muscle or protected it from mechanical injury, and this view was supported by the observation that hypnotics, while not affecting fibrillation, decreased the atrophy to an extent comparable to that brought about by quinidine. The results are in keeping with the clinical experience that prevention of mechanical injury—stretching seems to be the most deleterious—may keep the muscular atrophy within limits; more important still, these experimental findings should remove the prejudice against electrical treatment of the denervated muscle which was based on Langley's theory. As long as there was reason to believe that muscular atrophy was due to exhaustion by over-activity, some reserve in applying more stimulation seemed advisable. This theoretical difficulty is now removed. Moreover, the beneficial effect of electrotherapy no longer lacks experimental foundation. Fisher,[5] in experiments on rats, found that the electrically stimulated muscle, treatment being applied for 10–20 minutes a day—showed a striking increase of weight compared with the resting denervated muscle of the opposite side.

STITCH

THE cause of stitch has been much debated, and the decline of interest lately does not imply that it has been satisfactorily explained. The theories put forward—contraction of the spleen, distension of the spleen, pull on visceral suspensory ligaments, faulty vasomotor regulation with distension of the liver and spleen in "constitutionally inferior" subjects—were seldom formulated on first-hand information; and none of them explains every variety of stitch. Capps[6] has reported the results of a study, lasting several years, of 114 attacks of stitch which he observed personally in 55 people. He found them by watching the track team of Chicago University High School; men out of training at an impromptu track meeting at Northwestern University; students engaged in wrestling and basketball; and a few of his friends. He also listened to what the professional coaches had to tell him. Of his subjects, 44 were men and 11 women, and ages ranged from 15 to 65, but only 3 were over 35. He found that the right or left upper quadrant of the abdomen was the usual site of stitch, but it might occur anywhere in the abdomen, at the costal margin, at the nipple, in the precordium or—in one case—in the second left interspace. The position varied in different people, and often in the same person on different occasions. Some described the pain as sharp, some as dull, some as constricting, as a pressure, a cramp or a gnawing. It usually passed off quickly, but might last ten or twenty minutes. It was invariably brought on by physical exertion, ranging from walking to strenuous running, riding, swimming, boxing, wrestling, ski-ing, squash, or basketball. Walking was only a cause just after a heavy meal. Training had a variable effect; in 2 subjects attacks of stitch disappeared as training proceeded, in 3 others they persisted. This

1. Denny-Brown, D. and Pennybacker, J. B. *Brain*, 1938, **61**, 311.
2. Eccles, J. C. *Med. J. Aust.* 1941, **1**, 573.
3. Tower, S. S. *Physiol. Rev.* 1939, **19**, 1.
4. Solandt, D. Y. and Magladery, J. W. *Brain*, 1940, **63**, 255.
5. Fisher, E. *Amer. J. Physiol.* 1939, **127**, 605.
6. Capps, R. B. *Arch. intern. Med.* July, 1941, p. 94.

variation is well recognised by coaches. An attack rarely disappears if the exertion is continued, so that it has no relationship to second wind. Cold weather seems to be a factor. In a cross-country race run in a temperature of 15° F. 40 out of 60 competitors had to give up because of stitch. On another occasion one team "warmed up" outside in the severe cold and were able to finish the race, whereas their opponents warmed up indoors and all except one developed stitch. Deep breathing usually increased the pain; bending over towards the side of the stitch, or pressure over the site, usually relieved it. Capps suggests that the symptoms and the variability of the pain can be explained as being due to ischæmia of the diaphragm. The relation of the pain to exertion, the compulsion to stop exertion, the relief on resting, and the precipitating effects of a full stomach and of cold resemble findings in angina pectoris and intermittent claudication, and give grounds for considering the ætiology of stitch alongside that of these proved ischæmic conditions. That the pain is one-sided can be explained by supposing that one side is affected first; thanks to the interruption of exercise the other side escapes. The relief of the symptom by pressure over the painful spot or by bending towards the affected side could be explained by the consequent limitation of diaphragmatic movement. Capps mentions the agonising stitch-like pain of uncontrollable laughter; laughter is associated with a series of rapid contractions of the diaphragm, and "laughter, holding both its sides" is certainly commoner after a large meal. The theory that stitch is a referred pain from angina of the diaphragm to the intercostal nerves is a fascinating one, but the mechanism is as yet not definitely established. Stitch in the shoulder might be expected on this hypothesis, but this was not observed though sought for. Further evidence could be obtained by blocking the intercostal nerves involved in the supposed reflex, and possibly by observation of the diaphragm with X rays. The theory must also be weighed in the balance of clinical observation.

INTRASTERNAL TRANSFUSION

ANYONE with much experience of blood-transfusion must have been baffled by patients with non-existent veins, with veins which persist in becoming blocked (particularly where long and slow transfusions are required), with veins so collapsed or contracted in shock that they will not allow the transfusion fluid to pass, and by those cases in which every vein has already been used up. This problem seems to have been solved by Tocantins and O'Neill,[1] whose preliminary tests have been most successful. They found that saline solutions were absorbed rapidly from rabbits' bone-marrow and they adapted this finding to blood-transfusion in man. In adults the sternum is used, preferably the manubrium or midway between the angle and the xiphoid process. In children under three years the upper end of the tibia or the lower end of the femur is preferred. The technique is not difficult and can easily be mastered on the cadaver. Tocantins and O'Neill use an instrument consisting of a gauge-15 needle housing an inner gauge-18 needle which in turn contains a stylet. Three lengths are desirable—2, 3·5 and 5 cm.—and once inserted the needle is prevented from penetrating more deeply by a collar held by a set-screw. The site chosen is first anæsthetised down to the periosteum with procaine, and the double needle is then pushed and twisted down to the periosteum at right angles to the skin. Next the needle is tilted to about 30° with the skin and the anterior plate of the bone is perforated. This is recognised by a lessened resistance. The collar is then adjusted and the stylet removed. A syringe containing about 1 c.cm. of saline is attached to the inner needle and gentle suction should bring some marrow into the syringe. Not more than 0·5 c.cm. of marrow is aspirated and the inner needle is removed and flushed out with the saline and reinserted. Saline is alternately injected and aspirated through it to displace air from the outer needle. Finally 1–2 c.cm. of saline is injected into the marrow, the inner needle removed and rubber tubing filled with saline leading from the reservoir is attached to the outer needle. Speed is essential because marrow clots easily. At first the flow is only about 2–4 c.cm. per minute but it quickens in about a quarter of an hour. With a head of pressure of about 100 cm. the rate of flow in adults has been up to 25 c.cm. per minute and in the tibia or femur in children up to 4·2 c.cm. per minute. A successful infusion can only be given into a vascular bone-marrow and this will contain very little fat, so that the danger of fat embolism is said to be non-existent. Tocantins and O'Neill had no untoward reactions with 52 infusions in 33 adults and 7 infants.

1. Tocantins, L. M. and O'Neill, J. F. *Surg. Gynec. Obstet.* 1941, **73**, 281.

EVERYBODY'S BUSINESS

IN the United States health education has long been valued as a tool by public health workers. They recognise, as a recent report [1] from the American Public Health Association shows, that even with adequate sanitation, immunisation and enforcement of laws, no community can achieve its highest possible standard of health unless it has been educated to the job. To be wholly effective any programme would have to be universal, reaching every section of the public and taking into account both local and general public health requirements. No such universal plan is yet available, but individual ventures are afoot in many states, and a committee was set up by the association to study some of these; this report gives arresting accounts of them. Local programmes may have the drawbacks of parochialism, but they also have its advantages; for, as the report says, "it is a sound, democratic, self-reliant procedure for a group of people, with the help of specially qualified leaders, to find their own health problems and to seek the needed information through which they can solve these problems." The committee studied the health programmes in action in 26 communities in 12 states. Many of these communities had made great use of the schools in their plan, judging that the child's influence on the parent was likely to be considerable; advertisers indeed have long guessed as much and often plan campaigns which reach the parent through the child. Moreover, as the committee point out, the school is the only social agency employing trained educators in the ratio of one to every forty people. The usual approach was to get the children first to observe and make lists of the health needs of their community, then to analyse these in the classroom and study how such problems are being met elsewhere, and finally to plan a solution of their local problems which would be within the means of the community.

A campaign against hookworm in Bulloch County, Georgia, is a good example of the method. The zone committees of the schools learned through the state health department that 60% of the school-children were infested with hookworm, in one school the figure being as high as 83% and in another as low as 43%. Here was a communal as well as a personal problem. First the school teachers had to be taught about hookworm and to take a test set by the health department, which also supplied literature and films for the teachers to use later in the classrooms. Then the pupils studied the hookworm, its life-history, the way it spreads, and how those infested can be treated. They went home and told their parents about it, no doubt graphically. Plans were then laid for treating infested children and adults, and for preventing further soil pollution. The schools, the health department, the doctors, the parents of the children and the

1. Community Organisation for Health Education. A report of a committee of the Public Health Education Section and the Health Officers Section of the American Public Health Association, 1941.

rest of the grown citizens were all persuaded to take part in the campaign. By the spring of 1940 the incidence of hookworm in the schools had been reduced to 28%. Meanwhile pupils and teachers had been studying soil pollution and had come to the conclusion that it could best be prevented, in their county, by building sanitary pit privies. Each child then made a report on the presence or absence of such a facility at his home; where a pit privy existed he reported on its site and condition, and in this way a map of sanitary conditions in the county was compiled. The schools then sponsored a project for the construction of privies. Members of the Parent-Teacher Association gave the lumber, the health department provided the plans and chose the site, and other bodies were responsible for labour and transport of workers. Between the autumn of 1936 and the spring of 1940 approximately 3500 privies were built.

Other studies undertaken in the schools covered immunisation against smallpox, typhoid and diphtheria, provision of school meals, a campaign for better home gardens and home canning; all resulted in a substantial advance in standards, the full effects of which on health will be apparent in a few years time.

A similar story is told of Appomattox, Virginia, where the school-children and their mothers joined in making a survey of the drainage and water-supply of every farm-house. The value of safe water and possible sources of contamination were studied in school, and then the children set about planning improvements in their home water-supplies. Finally committees of pupils visited various farms and tried "to sell the idea of a better water-supply." As a result, springs were fenced to keep cattle out, curb and housing were provided for an open well, springs were cleaned, water was piped for stock, and other practical advances were made. One boy paid four persuasive visits to a family in whose unprotected water-supply mosquitoes were breeding; he failed to convince them that something ought to be done about it, but he learned a lot about the difficulties of achieving and maintaining a high or uniform standard in public health.

The report is full of stories of such victories and defeats and it is significant that the victories greatly predominate. To the English reader the striking thing is the plastic and friendly relationship which seems to exist between official bodies and the public. Might not our own well-fenced bureaucracies look askance at a public health plan in which school-children were expected to play a crucial and responsible part, or at a map of sanitary facilities which depended on the direct observation and report of the people using them?

GERMAN VIEWS ON BLOOD-TRANSFUSION

In war-time as in the good old days of peace it is worth while to find out what the other fellow is thinking or doing, but this becomes increasingly difficult as foreign journals get scarcer. E. Schulz, in a review of German blood-transfusion methods (*Dtsch. med. Wschr.* July 18, p. 779), says that the direct arm-to-arm technique is the best, though the fatality with this method is still 0·5%. Using anticoagulants, citrate gave rise to rigors but heparin did not. Clotting was also retarded by storing blood in containers with paraffin-lined walls. But the standard way of storing blood in Germany seems to be to mix it with an equal volume of doubly distilled water containing 0·5% sodium citrate and 4% glucose. Of blood substitutes, physiological saline and a crystalloid solution named "tutofusin" are stated to remain in the circulation for only 1–2 hours, but serum (fresh, stored or dried) and a colloid called "periston" which is said to have no pharmacological properties remain in the circulation for 12 hours. No hint of the composition of tutofusin or periston is given. Emphasis is laid on the value of blood-transfusion for conditions other than anæmia or hæmorrhage. For example, numerous small transfusions of stored blood are recommended in gas gangrene. Immuno-transfusion is used for sepsis, typhoid, diphtheria, influenza, erysipelas and typhus, and replacement transfusion—combined bleeding and transfusion—is recommended for acute toxæmia. Schulz is dogmatic about the quantities to be used; more than 400–600 c.cm. should, he says, never be given at one time owing to the possibility of heart damage, which is more likely to occur if blood substitutes are used. But for the hæmoconcentration of burns a blood substitute such as 30% glucose solution, periston or serum is preferred. In the treatment of shock only 200–250 c.cm. of blood or substitute should be given, but for fluid replacement 400–600 c.cm. is allowed. Such rigid standards, although they may serve to prevent over treatment by enthusiastic novices, cannot be in the interest of the patient. It must surely be better to treat the patient according to the deficiency from which he is suffering, and the limits Schulz sets will then often be exceeded.

CHILD ENDOWMENT

By an act which came into force early this year a federal system of child endowment has been introduced in Australia. From July 1 a payment of 5*s.* per week will be made for each child under 16 years of age in families containing more than one child, and a similar allowance will be made to children in approved charitable institutions. Normally the endowment will be paid to the mother and must be used for the child's "maintenance, training and advancement." It is estimated that about a million of the 1,830,000 children in Australia under the age of 16 belong to families with more than one dependent child so that the annual cost of the scheme is some £13,000,000. Two millions of this will be gained by abolishing income-tax abatements for each child after the first (so that the 5*s.* will not in some cases be a clear gain), two millions from general revenue, and nine millions from the proceeds of a new pay-roll tax. From the short account of this important legislation given in the *Ministry of Labour Gazette* for September, 1941, it appears that this tax is payable by all employers with a pay-roll of over £20 a week and is at the rate of 2½% on all wages, salaries, commissions, bonuses or allowances paid in money or kind. The working of this scheme will be watched with interest in this country. Meanwhile a similar but localised movement to ease the position of families with young children is reported from Birmingham. Acting on the advice of its salaries, wages and labour committee the city council has decided to give married employees 2*s.* 6*d.* a week for every child of school age, an innovation held to be more appropriate to war-time conditions, and fairer, than a general advance in wages for married and unmarried alike. The alternative method now to be widely extended is to provide a good midday meal for all school-children. This has the special advantage that it reaches not only necessitous children but also those whose mothers find it difficult, with or without endowment, to combine work of national importance in factories or elsewhere with the task of running a household. Appliances, staff and suitable premises may be hard to come by, but such difficulties are not to stand in the way; one way or the other we shall bridge the slough of despond through which too many families with young children have had in the past to journey.

At the Royal College of Surgeons of England on Tuesday, Nov. 4, at 2.30 P.M., Mr. L. R. Braithwaite will deliver a Moynihan lecture on the ileo-gastric syndrome. Two Imperial Cancer Research Fund lectures will be given by Dr. W. E. Gye, F.R.S., director of the fund. On Nov. 6, at 3.30 P.M., he will speak on cancer of the breast, and on Nov. 13, at 3:30 P.M., on filtrable tumours. Dr. A. P. Cawadias will deliver the Thomas Vicary lecture on Nov. 26, at 2.30 P.M. His subject will be hermaphroditism. All these lectures will be held at 1, Wimpole Street, W.1, and doctors and students are invited to attend.

Special Articles

SOLUSEPTASINE SPRAYING IN THE PROPHYLAXIS AND TREATMENT OF COLDS*

W. R. THROWER, M.D. LOND., M.R.C.P.

THE application of various sprays and other solutions to the upper respiratory passages enjoys general popularity for its supposed effects on acute catarrhs, but no scientific evidence has ever been advanced which would justify the widespread adoption of any particular prophylactic or therapeutic measure of this kind. Properly controlled research on "colds" is difficult to carry out on the scale necessary to produce results likely to bear statistical analysis. Several large experiments have been conducted in the past to evaluate some of the more promising agents for controlling colds, such as vaccines, vitamins and ultraviolet light (Bashford 1938, Sherman 1938, Diehl et al. 1938, Read 1939). The results, however, were disappointing.

Among matters affecting health in crowded air-raid shelters the question of what to do about colds featured largely but no existing method of prophylaxis or treatment seemed sufficiently established for immediate application; yet something had to be done and done quickly. Having in mind the usefulness of sulphonamides in controlling the secondary invaders of the common cold (Yates 1939, Elyan 1938, 1939), the feasibility of using these compounds was reviewed by the Horder Committee, for if even the unpleasant sequelæ of colds could be reduced it would be a distinct therapeutic advance. The prophylactic use of sulphonamides by mouth is open to serious limitations under the best conditions, and their widespread use among shelterers would be hazardous. There was some evidence that the course of common colds might be influenced by the application through an atomiser of a solution of disodium-*p*-(γ-phenyl-propyl-amino)benzenesulphonamide-α-γ-disulphonate, commonly called Soluseptasine, though a solution of this sulphanilamide derivative similar in all respects to that used for the present investigation in the form of nasal drops did not produce very striking results in a small-scale experiment (Dudley Hart 1941).

To apply a soluble sulphonamide in solution to an epithelium possessing the particular characteristics of that in the nose is a very different matter from placing sparingly soluble compounds into purulent wounds, concerning which opinion has been expressed elsewhere (Thrower 1940), or into carefully investigated wounds of the type described by Colebrook (1941).

Certain limitations are imposed by any field trial, and such weaknesses as may exist in the scheme finally adopted for shelters derive from the necessity of making the trial simple and capable of speedy completion. Such simplification was more than justified in the light of experience gained by working and living among shelterers, and the practical limitations of similar surroundings on any such future trial should be remembered. Unqualified census figures from individual shelters are misleading for various reasons. The floating population of all shelters is high, owing to social visits and similar causes. This irregularity can be lessened by the ticket system of entry. Quiet nights are immediately reflected in poor attendances, and with an early "all clear" many naturally return home. Arrival and departure times are variable, depending on such diverse factors as the closing times of public-houses and families waiting for treatment "until Dad comes from work." The mass exodus in the morning raises its own problems. Ailments totally unconnected with the one being investigated are suggested as being due to the test, and this leads to defection in the control as well as in the treated group. The idea that "they are doing something" about upper respiratory infections has considerable popular appeal, but the need for regularity, always important but doubly so in any trial, is unappreciated by the public at large. Persuasion is the only approach possible, since there is not even the discipline of a hospital outpatients or the health service of a large undertaking. Treatment at an entrance doorway is impracticable, and plans for each shelter must be devised on the spot. Mass treatment at medical aid-posts does not work.

As originally conceived, the trial was planned to determine whether the routine spraying of nostrils would have any effect on the incidence of colds, but separate records were made to determine whether treatment shortened the period of malaise and local discomfort. Solutions of various compounds in different strengths were tested privately on volunteers but all were abandoned for various reasons, with the exception of a 10% solution of soluseptasine in water containing 20% w/v glycerin to lower surface tension. For the control group the solution used was normal saline.

One basement-type shelter was selected for treated cases, and one in an adjacent London borough for control cases, no-one knowing the nature of the solutions used. The general conditions in these shelters were comparable in that they were in the basements of modern flats and housed people of similar social type. The average nightly population during November, 1940, was approximately 250 in each shelter, but the numbers declined with quieter nights, to rise again with more aerial activity, different people, however, often taking the place of the former occupants. The general decline in all shelter populations, apart from staffing difficulties, made the obtaining of reliable statistics in immediate further trials of this nature so unlikely, except under unmanageable conditions, that two tube stations were chosen for further trials, as probable sources of quick results. A tube station of simple design was selected, the up platform being used for treated cases and the down platform serving as control. The net numbers treated here again reflect the problem of the floating population and defections. As a control against the first station, another one was used, but the results proved worthless for statistical assay owing to sociological difficulties. The results obtained in basement shelters cannot be compared with those obtained from tube stations owing to the entirely different nature of the surroundings.

TECHNIQUE AND RESULTS

A mixed group of men, women and children were sprayed in each nostril with the appropriate solution night and morning with three puffs from an ordinary nasal atomiser, the total quantity used being kept as constant as possible at about 0·6 c.cm. (i.e. 60 mg. soluseptasine).

For the guidance of other workers a few practical points are worth recording. To those who are not laryngologists it is remarkable what a wide variation there is in the size, shape and direction of the nasal passages possessed by an unselected crowd of people. Some practice is needed with individual cases to be sure that the atomised solution comes into wide intimate contact with the nasal mucosa. In ordinary practice among patients who may have to treat themselves it may be important to ensure that this proper application is effected. Constant use of atomisers shows how frail and unreliable many of them are. Metal nozzles are essential so that quick sterilisation in a flame is possible when numbers of patients have to be treated. In any large-scale treatments constant supervision by a medical man is necessary in the early stages, not only to reassure the public but also to train nurses or other helpers in the requisite technique.

No epistaxis or signs of general toxicity occurred in either group. Subjects in both the treated and control groups, particularly the former, remarked that they tended to have wetter noses than normally, and maybe some pronounced cases of this wetness have been recorded as colds on single occasions when diagnosis by a qualified person was not possible; these doubtful cases have been excluded from both groups before the assessment of results. There were no complaints of nasal congestion or obstruction, while chance sampling with a nasal speculum revealed no abnormalities. Some subjects with colds in both groups claimed relief of symptoms immediately after the spraying.

A log was kept showing the occasions on which people were sprayed night and morning, and recording the onset

* Based on the report of an investigation carried out on behalf of the Horder Committee on Health Conditions in Air-raid Shelters (Ministry of Home Security and Ministry of Health).

and duration of colds, including those already in existence when the trial commenced, the first 36 hours of these being excluded. People who said that they were suffering from a cold often claimed relief in 12 hours (when the next record was made), but these "colds," as mentioned above, have been excluded from the total figures. The low average period of observation despite the large numbers treated is due to the chronic absenteeism, while people who received less than seven days' treatment have been excluded.

Prophylaxis.—In the basement shelters 57 treated persons were observed for an average of 1·5 weeks, and 43 (75%) had colds. Of 70 controls observed for an average of 2 weeks, 39 (55%) had colds. In the tube stations 115 persons were observed for an average of 2·8 weeks, and 12 (10·4%) had colds. Of 90 controls observed for an average of 2·5 weeks, 18 (20%) had colds.

It will be seen that in the basements there were proportionately more colds in the treated than in the control subjects, whereas in the tubes the reverse applied. The variations in both cases were greater than could be explained by mere chance, but I cannot put forward any other explanation. Both basement shelters had epidemics of colds during the experiment.

Treatment.—In the basement shelters the average duration of colds has been roughly assessed from the protocols as 60 hours in the treated and 199 hours in the control group. In the tube stations the average duration was 28·9 hours in the treated and 49·8 hours in the controls.

The difference in duration of the colds in the two types of shelter may have been due to the better ventilation and greater space per person in the tubes, or it may, of course, have been due to greater virulence of the organism producing the epidemic colds in the basements. No clinical pathology was possible, so that the nature of the colds could not be determined.

CONCLUSIONS

In the small controlled experiment completed no case was made out either for or against the prophylactic spraying of nostrils with a solution of soluseptasine. The practical limitations to success in such a procedure suggest that no useful purpose would be served by continuing this in the shelters at present. The basis is admittedly small, but the figures do suggest a reduction in the average duration of colds in both the treated groups compared with the controls. This confirms the clinical impression concerning soluseptasine which justified the trial being carried out, and a repetition of the work is desirable on people living in closed communities suffering from colds, using the technique developed during the present investigation. Observations in connexion with general hygiene which must affect the incidence of upper respiratory catarrhs were outside the scope of the experiment.

Credit for the expedition of the trial is due to Dr. G. H. Oates and Dr. H. A. Bulman, medical officers of health, and my thanks are due to the scientific staff of Messrs. May and Baker Ltd. for technical assistance, and to Mr. Bradford Hill, D.Sc., for checking the results.

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MEDICINE AND THE LAW

Damages against Chiropodist

IN Colston *v.* Frape, a recent case at the Barnstaple county court, a woman recovered £62 15*s.* damages with costs for injury to her foot. She had visited a chiropodist for treatment of her corns; he advised her that her toes required treatment. When she paid a second visit for this purpose he took hold of her foot with both hands and twisted and jerked it with some force. Such was her evidence, and she complained that, in consequence of the wrench, she suffered pain and could not now walk so well as formerly. The defendant, who described himself as a chiropodist and specialist in the fitting of shoes, said that he formed the opinion that the plaintiff was suffering from some form of pressure on the nerves; he denied wrenching her foot or inflicting worse pain than she was already experiencing. He had manipulated the foot in order to "free the nerves and strictures"; he admitted that this might have caused some local "stagnation" to flare up. The judge held that the chiropodist, though neither responsible for the original condition of the foot nor negligent or unskilful in his treatment, had been at fault in his diagnosis or advice. If he did not know what was wrong, he ought to have advised the plaintiff to see a doctor. The court awarded damages for the injury due to the wrong treatment being administered after the primary injury had occurred. The judge did not fail to point out that the plaintiff had voluntarily submitted to the treatment and knew quite well that the chiropodist was not a surgeon. We have noted in these columns other cases where a patient's faith in an unqualified practitioner has been inadequately rewarded. The Medical Act set up a Register because, as its preamble declares, it was "expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners." This is no advantage to patients who prefer to get their manipulative surgery from a chiropodist.

Professional Monopoly

In spite of such cases the uninstructed public will doubtless continue to speak as though registered practitioners possessed a monopoly of practice in surgery and medicine. If one wants to see a true professional monopoly at work, one should turn to the legal profession. Penalties await any unqualified person who dares to "act as a solicitor" or sue out any writ or process as such, or begin or defend any legal proceeding in the name of any other person, or who, "for or in expectation of any fee, gain or reward," draws or prepares a will or other legal document. The new Solicitors Bill, which has passed through Parliament with an ease the more surprising because its clauses have no intimate connexion with the national war effort, fortifies an already formidable organisation. An unauthorised person will have the onus of proving that he did not act for or in expectation of a fee. Every solicitor will have to join the Law Society, though this requirement will not operate until a poll of all practising solicitors has shown a two-thirds majority in its favour. Another interesting feature is the creation of a compensation fund to relieve the losses suffered by members of the public through acts of dishonesty or breaches of trust committed by solicitors or their clerks. To this fund every solicitor will have to make a fixed annual contribution not exceeding five pounds. Shall we yet see all registered medical practitioners compelled by law to contribute to a pool for guaranteeing patients against the consequences of professional negligence?

E.M.S. Surgeon's Libel Action

One of the surgeons appointed by the Ministry of Health to deal with war and air-raid casualties under the Emergency Medical Service had occasion recently to claim damages for defamatory statements suggesting that he had been inconsiderate, incompetent and negligent in the exercise of his professional duties. The plaintiff was Mr. G. H. Lawson Whale, F.R.C.S., who had been appointed to the Hampstead General Hospital. After an air-raid on Hampstead a year ago a mother and two daughters attended at the hospital. One of them was discharged at once; another had a hæmatoma near her mouth and the medical practitioner who attended to her asked Mr. Whale's opinion about tracheotomy. After making an examination Mr. Whale advised that the operation was unnecessary. Three weeks later Mr. Thomas Sargant, in whose house the three women lived, addressed to the secretary of the hospital a letter complaining that the surgeon who attended to them was "callous and brutal in his attitude to them"; he was "chiefly concerned to get them out of hospital as soon as possible"; he "succeeded in his harsh manner in reducing all the patients to tears." Later Mr. Sargant

wrote that the surgeon in question was Mr. Lawson Whale. Mr. Whale naturally took action upon these damaging statements. As his counsel explained, he did not seek punitive damages but merely asked for a verdict which would discourage such allegations as Mr. Sargant made. The three women were not Mr. Whale's patients; it was no part of his duty to interfere in their treatment unless invited to do so. Mr. Sargant had been told that he was misinformed; he had, however, refused to accept the statement. Mr. Whale denied in the witness-box that the hospital was conducted in the spirit of getting rid of patients as quickly as possible. Mr. Justice Atkinson asked if the Ministry of Health had issued any instruction for turning patients out on a war-time rather than a peace-time standard. Mr. Whale replied that he had always found it easy to keep patients there as long as he would have done in normal times. The hospital staff had been warned to regard themselves as a casualty clearing station rather than as a base hospital; actually they had found it possible at all times to act as a base hospital. Mr. Arthur Gray, F.R.C.O.G., a colleague at the hospital, expressed the opinion that the three women were not in fact suffering from shock.

Mr. Sargant gave evidence on the second day of the hearing and explained his motives. His original letter had said that he made his protest as a ratepayer; in his written defence he had pleaded that the occasion was privileged inasmuch as he addressed the hospital as a citizen, taxpayer and ratepayer of Hampstead, in good faith and without malice, under a sense of duty to someone who had a corresponding duty in the matter and in the honest belief that the contents of his protest were true. If the occasion were privileged Mr. Whale would not succeed unless he could prove malice. Having heard Mr. Sargant's evidence, Mr. Whale felt satisfied that the defendant had acted in good faith. He himself had been concerned merely to protect his reputation against what seemed the malicious attack of a busybody. He was now prepared to withdraw the action and pay the defendant's costs; Mr. Sargant on his side acknowledged that his letter had been too strong and expressed his regrets. The judge approved the settlement. In his view the occasion of the letter was undoubtedly privileged. It was important, he observed, that it should be made clear that there had been no plea of justification; Mr. Whale's course of action implied no admission that complaint was well founded. So long as there was no reflection upon Mr. Whale, his lordship was satisfied with the result; he did not wish it to be thought that this termination of the case reflected upon the plaintiff in any way.

SCOTLAND

THE SCOTS HOSPITAL PROBLEM

ON Oct. 14 the Secretary of State for Scotland, replying in the House of Commons to a question on hospital policy, said that he was having consultations with the bodies concerned and could not at that stage add anything to the general statement made by the Minister of Health. The bodies concerned are presumably the voluntary hospitals, the local authorities and the Nuffield committee. The Minister of Health in his general statement foreshadowed some special measures applicable to Scotland in the formulation of hospital policy, and doubtless these special measures will be under discussion at the meeting to which Mr. Johnston referred. The difference between the hospital problem in Scotland and that in England is essentially one of degree. Scotland, as is well known and as was brought out in the report of the Committee on Scottish Health Services, is not nearly so well provided with hospital beds as is England. If, as Mr. Johnston said in opening the Ayrshire Central Hospital recently, it is the aim of the Government in their plans for the post-war hospital service to ensure that proper treatment is available to every person in need of it, the question of adequate provision in Scotland is one that is bound to be compelling. It is probably true, as the Secretary of State said at Ayr, that there are large numbers of people suffering unnecessary pain or discomfort, unable to pull their full weight, the condition of many of them deteriorating. He wants to remove that reproach to our hospital system, and he wants to develop the hospital service in the form of a kind of partnership amongst the various hospital authorities, and especially to see the greatest possible coöperation between voluntary hospitals and local authorities, so that every hospital may fill the roll best fitted to it in a coördinated scheme on a regional basis. The Secretary of State desires, by implication, to retain the voluntary hospitals, and doubtless he must be giving serious thought as to the best method of giving necessary state aid to them—whether through the agency of local authorities or not. He must be concerned, too, to know how best to utilise the ad-hoc hospitals erected under the auspices of his department and directly administered by it. These hospitals were primarily designed to fill gaps in the treatment of war casualties, but it would be preposterous to allow them to fall into disuse when the war is over, though there may be a strong Treasury urge in that direction. It seems probable that these hospitals will have to be retained as important entities in a coördinated service involving local authorities, voluntary hospitals and the Department of Health. Whether the last named will wish to continue to administer these hospitals directly is one of the intriguing but comparatively minor problems that beset the Secretary of State.

HEALTH OF EIRE

THE report of the department of local government and public health for the year ended March 31, 1940, records a decline in the incidence and mortality of the principal infectious diseases, in infant mortality and in maternal mortality. The number of notifications of infectious diseases—6146—was the lowest since 1930, and about 1900 fewer than in 1938. This reduction was mainly due to a fall in the incidence of scarlatina and of diphtheria, the latter probably due to the campaign of preventive immunisation carried out in recent years by the county medical officers of health. Yet there were still 2097 cases of diphtheria with 245 deaths and 2779 cases of scarlet fever with 43 deaths. Compared with the previous year, typhoid notifications had risen from 254 to 385 and the number of deaths from that disease from 46 to 56. Many of the cases were traced to carriers. In a local epidemic in co. Kerry, with 103 cases and 8 deaths, infection was spread by separated milk from a creamery. The milk was apparently infected by a case of typhoid in one of the farms supplying the milk. In the creamery the cream was pasteurised and converted into butter, but the separated milk was sold untreated. In most of the cases there was definite evidence that the separated milk had been consumed by the patient; no case was traced to the butter. There were only 5 cases of typhus, with 3 deaths, and this disease seems to be gradually disappearing. Only 76 cases of puerperal sepsis were notified, the smallest number for many years; the number of deaths from this cause was 38, the lowest on record.

The infant mortality-rate was 66 per 1000 births, which is lower than that for Northern Ireland (70) or Scotland (69), but higher than that for England and Wales (50). Congenital debility heads the list of the causes of infant mortality, premature birth comes second and diarrhœa and enteritis third. The infantile death-rate in urban areas was 83 per 1000 births—90 in Dublin—and the rate for rural areas was 55. Mortality from tuberculosis had increased—1·13 per 1000 of the population as against 1·09 in the previous year. But these are the two lowest figures ever recorded. There are no trustworthy statistics to show the incidence of the disease, as notification is only mandatory where the sputum or other infective discharge is liable to spread infection. This useless order dates back to 1919 and has always hampered the campaign against tuberculosis. Nevertheless, owing to the great effort which was made to assure notification and certification it is probable that the increase was not real. The medical officer of Cavan said: "The generation now growing up has little or no conception of the universal dread of this plague which prevailed when the campaign against tuberculosis was initiated thirty years ago." Most of the medical officers of Eire have worked hard to overcome this dread, which lived in Ireland long after it had died elsewhere, and because of their efforts and the growing enlightenment of the people concealment of tuberculosis is gradually passing, but it is still prevalent, especially in the west. In 1939 135,404 school-children were examined. Dental defects were observed in 46·6%,

and disease of the tonsils or throat in 19·1%. Treatment of these conditions is provided free where necessary.

The administration of the Milk and Dairies Act by the local authorities has been on the whole satisfactory, and legal proceedings for non-compliance with statutory requirements have been successfully instituted, though the report adds that some local authorities were reluctant to take action on the recommendations of their medical and veterinary advisers. This seems to understate the case, for many local authorities fail to appreciate the importance of the act and are unwilling to prosecute negligent milk-producers, while the local justices fail to impose adequate penalties in the cases brought before them.

During the year 952,936 new cases were attended by the 646 dispensing medical officers. It seems, therefore, that about a quarter of the population of Eire received medical attendance under the Medical Charities Act. The income of the Hospitals Trust Fund for 1939 was over £1,202,600, and the expenditure £367,800. Grants of £270,384 were made to poor-law and county hospitals, and £209,822 to voluntary hospitals, of which £126,072 was to meet current expenses.

ARGENTINA

AVIATION

A SERVICE of air ambulances for both official and private use has been established under the control of the national department of health. When used for private patients the charge is 50 centavos a kilometre. Three machines are permanently attached to this service in the sparsely populated regions of the Chaco and the southern territories. Analysis of the effects of aviation on both healthy and sick people has led Prof. M. R. Castex and his colleagues to conclude that of the cardiac and circulatory disorders only cases of myocardial degeneration can safely be carried by air, and that patients with respiratory affections other than bronchitis or chronic pleural disorders of a non-exudative nature should also avoid flying.

It is planned to establish a division for the sanitary supervision of aircraft in the department of health, with a view to checking the spread of infection by aircraft arriving from infected regions. Aviation is on the increase in the Argentine. In 1938 there landed in Buenos Aires 770 aircraft carrying 7300 passengers, whereas in 1940 the figures were 1800 aircraft and15,800 passengers. Aircraft may carry infected insects, but there is also the risk that passengers may still be in the incubation period of an infectious disease when they arrive and so will not appear ill.

BREAST-MILK CENTRE

The government has established a non-profit-making centre in Buenos Aires for extracting, preserving and distributing surplus breast milk. The old mothers'-milk stations were mainly based on the wet-nurse system, but this centre obtains its milk from normal mothers, and it is found possible to take 200–300 grammes from many mothers without depriving their own children. The donors' family histories are inquired into, and they undergo a periodic clinical, radiological and serological examination. During 1940 over 5000 litres of milk were supplied to 1200 babies from 350 donors. The price charged ranged from 7*s.* a litre down to nothing according to the means of the recipient; more than half of the milk was supplied gratuitously.

PSITTACOSIS

During the pandemic of 1929–30, which involved Buenos Aires and part of northern Argentina, about 200 cases of psittacosis were reported. Then in the next nine years there were only isolated cases, but in 1939 an outbreak in Buenos Aires produced 27 cases, of which 13 (48%) died. The disease mainly attacks adults of 45–55 and hardly ever children. Men and women are affected equally, and bird-dealers are, as might be supposed, the commonest sufferers. Cold weather seems to favour the propagation of the disease, and the incubation period is 7–14 days. During this last epidemic hæmorrhagic skin lesions have been observed. No treatment has been of any avail.

HEART DISEASE

Of 10,000 school-children examined in Buenos Aires 2·4% had organic heart disease, 2% being acquired and the remainder congenital. It is hoped that early recognition of cardiac lesions will improve the prognosis, for Prof. Rafael Bullrich estimates that the mortality from cardio-articular rheumatism is at present as high if not higher in the Argentine than in any other country, and a speaker in the Senate said that 2·4% of Argentine children under 14 die from the disease. According to Macera and Costa Bertani the fatality from acute rheumatism in children under 15 is 22% in Buenos Aires and 12·5% in Rosario.

Professor Bullrich has also made a clinical and statistical study of people over 60, and in the last ten years he finds that circulatory diseases accounted for 43% of the deaths between 60 and 80; if nephritis is included (and nearly all cases in this age-group are circulatory in origin) the figure rises to 47%. Since 540,000 of the 13¼ million population of the Argentine are over 60 the social significance of these diseases is clear. The number of hospital beds for such cases is insufficient, but much may be hoped from the work of the Institution for Social Assistance to the Cardiac, of which Professor Bullrich is director. This institution, which is a voluntary one and has been running for three years, undertakes the care of pregnant women, nursing mothers and children with cardiac lesions, promotes the organisation and equipment of dispensaries and colonies for their treatment, and puts forward legislation on behalf of workpeople with heart disease. At a congress of the institution recently held in Buenos Aires it was urged that clinics for heart disease should be established in the Argentine such as already exist in Britain and the U.S.A. Dr. Luis Sabathie, who has lately published an extensive monograph on the subject, emphasised the inadequacy of purely medical methods in treatment. One remarkable statement made by subsequent speakers was that 70% of anarchists and other revolutionaries suffer from some physical disability which prevents them from following a normal calling.

WOMEN CONFER ON INDUSTRY

THE second session of the London Women's Parliament, held on Oct. 27 at the Conway Hall, was attended by 371 delegates representing 211 groups, which included coöperative organisations, guilds, trades unions, discussion groups and education committees. Mrs. NAN MCMILLAN, recently president of the National Union of Women Teachers, took the chair.

Miss MARY CORSELLIS, the organiser, was able to inform the meeting of the results of the first session. Improvements had been reported from factories to which the L.W.P. had sent delegates. The Parliament had been recognised by the Minister of Labour; suggestions on milk rationing and the differential distribution of oranges had been adopted. An investigation of conditions in factories had been carried out and an inquiry into the provision of day nurseries and into school feeding was foreshadowed.

Discussion at the second session ranged over a bill to regulate supplies and distribution of food, and a series of proposals designed to remove the obstacles now preventing women from playing their full part in industrial production.

The speakers were lucid and brisk, much more concerned with facts than theories. Among them were councillors, teachers, transport workers, ambulance drivers, clerks, housewives, nursery school supervisors, canteen managers and workers from clothing, munition and aircraft factories. They had many abuses to point out, but there was a striking growth, during the meeting, of the conviction that it was not by individual and intermittent grumbling that these could be remedied, but by the deliberate and combined action of the women doing the jobs. The factors held to be largely responsible for keeping women from keen participation in the work of production were low wages, insufficient day nurseries, long working hours and consequent shopping difficulties, bad canteens and inadequate transport.

WAGES AND WORK

Of these perhaps low wages received least attention in the discussion, although the hardship caused by this factor is sometimes great. Some girls under 20 are unable to earn a wage on which they can get enough to eat. In most factories women are paid much lower

wages than men; thus inquiries made by the organising committee in a large number of factories showed that a woman in engineering now earns a minimum of 38*s*. In Government training centres this is the starting wage, and after three tests she gets 47*s*.; a man earns 22*s*. 6*d*. more throughout the training course. When a woman leaves the centre and starts work in a factory she drops back to 38*s*. plus a bonus for piece work; but in explosive factories many processes are too dangerous for piece work. The average earnings for an adult woman in engineering today are below £2 10*s*. (equivalent to 39*s*. before the war). When she has paid for food, lodging and transport she may find herself only a few shillings in pocket at the end of the week. If she has to contribute to the care of her children, or send money home to her family she may have less than enough for food. National Service officers have been obliged in some cases to release a woman from nationally important work on the ground that the pay did not enable her to support herself. This is made worse by the fact, which came out clearly in discussion, that many women, though trained for and capable of skilled work, are being used in factories as cheap labour to do routine jobs which could be entrusted to a newcomer, and are thus being prevented from earning higher rates of pay.

Miss G. ROWLAND, speaking of the large engineering factory at which she works, said there was no collaboration between the Government training centres and the factories. Women trained as toolmakers would go to the factories and be set to work on some other task. She estimated that 50% of women fail to get employment in the job for which they have been trained; and recently workers at her factory had decided to arrange a small conference between delegates from the factory and instructors from the centres to discuss better collaboration in the district. Miss NORAH BROWN, a member of the organising committee of the L.W.P., pointed out that there had been a 33% increase in fatal accidents in factories in the past year. Some of these are doubtless the outcome of fatigue due to long hours—a ten-hour day and a 56-hour week is common—some to lack of training; but an increase in legal penalties for such accidents, she thought, showed that the management had been responsible for some.

FOOD AND SHOPPING

The hours worked make shopping problems serious for women. Mrs. HANSON, a transport worker, said that in Birmingham women employed in the factories only had Saturday afternoon on which to do all the buying-in for the week; the shops were then so crowded that many of them could not even buy their rations. The city council, when approached, said that this was a national problem, and that they could do nothing until some national plan had been devised. In Finchley it seems they are more progressive; there, Councillor Mrs. DIANA PYM said, the food committee has organised passes for women workers so that they can get their proper share of goods in the shops. She suggested that shops might arrange to stay open later on one night a week. The problem of shopping would of course be much eased if there was more provision for communal feeding and for school meals for children. The topic of school meals was very close to the heart of the meeting. Mrs. MARY MARSTON pointed out that they were especially necessary where the mother went out early to work at the factory; she dared not leave the children alone in the house with a fire burning, so she usually brought them along to school. They hung about, turning somersaults on the railings and getting rather cold, until school opened, and then had nothing to look forward to at lunch-time except a sandwich of doubtful ingredients—and "no little bit of pudding." Other speakers agreed in disparaging such "nosebag meals," and all felt that the Government should be pressed to carry out its promise of universal school feeding.

The lack of day nurseries, however, was felt to be the paramount factor keeping women out of industry at present. Mrs. CARTER, of the Society for the Provision of Nursery Schools and Day Nurseries, said that local authorities had the power to set up nurseries but many of them had not done so. They thought that mothers could always find a neighbour to look after children; such authorities, she said, were inexorably "minder-minded." The society was working hard to get more nurseries set up, and much was to be hoped from the conference on war-time nurseries to be held under the chairmanship of Lord Horder on Oct. 29.

CANTEENS AND HYGIENE

The need for good canteens was also discussed freely. Again much turns on the confidence existing between the management and the workers. Some employers provide no canteens, some hand the canteen catering over to a contractor who makes little attempt to provide good food or serve it tolerably. In other firms the workers take a share in running the canteen and can see to it that the food and service are good. Mrs. TOWERS told how she had worked in a West Country factory where a canteen was ultimately provided after much pressure; but the food was uneatable and she finally found herself doing 12 hours a night, seven nights a week, and travelling an hour each way, on a diet consisting largely of tea and cigarettes. Faulty diet of this kind cannot fail to cause ill health and absentee-ism. Poor hygiene in the factories must add to the danger; little was said about this during the discussion, but investigations by the organising committee show that ventilation and heating are grossly defective in some factories and that toilet facilities may fall below the level of the most elementary hygiene and decency. Thus in one factory three basins are filled with hot water in which 60 girls have to wash their hands; in another there were recently 200 cases of impetigo, and a department employing about 200 had five washbasins and four towels; in another girls have to ask for a pass to go to the toilet and there is no ventilation in the lavatories, which are permanently blacked out.

The session passed unanimously the bill to regulate supplies and distribution of food by registration and rationing, control of prices, school feeding, and by the provision of canteens and communal kitchens.

In England Now

A Running Commentary by Peripatetic Correspondents

THE student of human nature who wants a new field for observation should try the wardroom of one of H.M. ships in war-time. Excluded for months on end from all normal associations—from the good earth (whoever has experienced the nostalgia for a patch of land in which to dig, bred by months of unrelieved seascapes, can understand the popularity of gardening among sea-going men), from trees, animals, weather that could be remotely related to a modest idea of summer, and above all from the companionship of the opposite sex—members of the mess settle down each to an individual level, some giving more in one way others in another, and a few taking more than they give. I fancy they all go through a cycle, almost as regular as the menstrual one, of depression followed by elation, each phase of depression always lasting for the same number of days. There are some people whom nothing seems to shake, and who are nearly always ready with a smile and a joke; and yet occasionally when off their guard they too seem a little less ready with their banter than usual. Once in a blue moon there comes the big day when it is possible to entertain for an hour or two some of the ladies of E.N.S.A. who so heroically come to the most outlandish places to cheer the troops. The change in atmosphere on the morning of the party fully justifies Freud in assuming sex to be the root of all behaviour. The mess is split into three parties. There are the less junior members who have a wife and family tucked away somewhere and who are not really in the running: "But if we were, by Jove . . . ." You have to watch this lot pretty carefully or they will have sneaked her away into a corner before you have had time to get your cigarette-case out. Then there are the quiet, introverted kind who will probably take a bad fall if they have not done so already, and who will probably marry late. They enjoy the party and hand the drinks round beautifully, but do not get a chance to develop an attack in the short time and limited field available in the wardroom. The third type is the thorough extrovert who makes, in a specified time, more noise and greater impression on the target than anyone else; they remind one of a barrage from the close-range weapons. They usually sweep the girls off

their feet at the first encounter and beat off all opposition for the duration of the party.

Alas, the ladies have come and gone. Tomorrow we shall be back to our old selves again and the difference will be as that between leavened and unleavened bread. I think I know to which of the last two groups I belong, but it must be time for a change. All I got was a glimpse of a blonde head and a well-turned ankle and a good view of the back of the Commander's neck.

* * *

The course of propaganda never did run smooth; in an evacuee hostel it becomes a kind of switchback, even though you have the ear of your public and were once a doc yourself. At our hostel two cases of diphtheria broke out at the end of June, within a day or so of each other. One of the patients was a twin, and both of them were called Angela, so that a general air of confusion must be expected in this account which can only be distinguished from "The Comedy of Errors" by differences in style. Well then: the twin, Angela A. aged 5 had been immunised with her sister four or five months before, awkwardly enough; and she had had no known contact with a case of diphtheria. But Angela B. aged 6 had only been back for a few days after four weeks in hospital with scarlet fever. We had already had a stormy time with scarlet fever, so we were glad enough to submit to a full-dress investigation. Throats were swabbed and offers of immunisation were scattered broadcast. Angela A., however, had shaken the confidence of our mothers. Had she not been immunised and had she not "got it" after all? She had. They shook their heads at our glib arguments, pinning their judgment to facts as inopportunely represented by the case of Angela A. Only 8 mothers out of the 30 thought our guess was better than theirs and allowed their children to be immunised. The swabs all came back negative, and there were no more cases until the two Angelas returned from hospital, 6 weeks later. Ten days after the return Angela A.'s twin sister, Brenda A. developed symptoms and was sent to hospital. Here was a smack in the eye for propaganda. The medical officer of health came and took swabs of Angela A.'s throat, and the Klebs-Loeffler bacillus was grown from her postnasal discharge. Back she went to hospital. Rather sheepishly we brought up the topic of immunisation again. The mothers didn't think a lot of it; they were too polite to say so, but they sniffed rather eloquently. But help was on the way. Angela A. had sunk us, but her twin Brenda, with a nice sense of fair play, threw us a lifebelt. She came home in a fortnight, never having had a positive swab. This was a test case, and one which nobody could sniff at. Twins, I mean, everyone knows how ready twins are to catch the same thing; and then Angela and Brenda A. had been inseparable after Angela came back from her attack in hospital. If Brenda hadn't got it, it must have been because of that immunisation. It was as clear as mud. I began a telling campaign based on these arguments, and went on to talk of winter—blackout—close quarters—closed rooms. Gradually they came round, and now, at the beginning of October all the children are in the thick of being immunised, and we have had no more infectious cases. That's a bit of luck.

* * *

What are the motives behind the thousands now being bled to help stock the blood-banks, and the tens of thousands who await the call? And what do they imagine happens to them when they are bled? Some enrol to experience something new, others because they think, or their doctors have told them, that they suffer from blood-pressure, whereas a very few are actuated by the desire to secure the interest and possible admiration of their circle; the vast majority, however, are moved by loyalty to their country's cause and a genuine desire to give their blood because it is needed. Most of the volunteers are phlegmatic and their desire to serve costs them little in anxiety or discomfort. But an important minority must resolve conflicts and overcome fears and doubts before reporting for duty, and these deserve the full sympathy of the phlebotomist. In peace-time they are represented by those relatives who loathe nothing more than the thought of giving blood and who would never volunteer were it not for a loved one in need. Some of the volunteers, who have had no opportunity of discussing the matter with one who has been "blooded," imagine that an artery will be opened in the arm and that the blood will be caught in some sort of vessel (presumably on the down-throw); later, stitches will be put in (if the bleeding *can* be stopped) and the exsanguinated victim will be sent home in the hopes that new blood will be made during the week-end. It says a lot for the altruism of these apprehensive realists that they have steeled themselves for the ordeal. In small towns, the dangers of giving blood are often magnified by stories circulating of oozing which the doctor could not stop, of bleeding which recommenced that night in the pictures, of faints at the tea-table, of lumps in the arm, of "the septics" and of all manner of conceivable ailments attributed to blood-letting. On the other hand, some expect an operation as trivial as the grouping test—"I find my 'bus doesn't go for another twelve minutes so I thought you might take my blood now."

The introspective volunteer will arrive at the centre with a dread of experiençing pain (often they compare their feelings to those experienced in the dentist's waiting-room), a fear of seeing blood, especially his own, and of making a fool of himself in the presence of others. In case our donor-elect happens to be of this stamp, one cannot expend too much thought and care on him when he is called on for the first time. It is a natural and deeply rooted instinct to feel faint at the sight of one's own blood, and even the thought of it will cause some people to feel squeamish. It is, therefore, an injustice to resent the attendance at the bleeding centre of those who are not very stable in their vasomoter systems, and to regard them contemptuously as "neurotic." The fainting is a "protective" reflex, for the consequent fall of blood-pressure helps both to lay the subject flat and also to arrest the hæmorrhage. It is as well to satisfy oneself that the volunteer is in good health and willing: the fact that the candidate was well on enrolment two years ago is no guarantee that he or she is fit to be bled now. We find it adds enormously to the comfort of the donor if he receives a small intracutaneous injection of procaine prior to the insertion of the "donor" needle. The two who in error received an injection of sal volatile were presumably of the phlegmatic type or they would have complained: or can this diffusible stimulant have anæsthetic properties yet to be explored? It was only when we set about reviving a colleague's wife with a tot of procaine that we realised that the dispenser had put up both these substances into similar bottles.

How grateful we are to those who perfected the present M.R.C. needles and the bottle with its fashionable waistline! A wider neck, perhaps, would have been preferable, being more readily adaptable for bottling gooseberries during the close season for blood, but otherwise we have no complaints. It is unnecessary, and uncomfortable for the donor, to employ too great a pressure on the sphygmomanometer cuff. While the needle is being introduced through the anæsthetised spot an initial rise to about 50 mm. Hg is desirable and the donor should be told to squeeze a bandage or a one ounce screw-capped bottle in his fist. As the blood begins to flow, the pressure can be lowered to 30 or 20 mm. and it is surprising how often no pressure at all is needed, even if the donor has partially relaxed his hold on the bandage or bottle. Some of our volunteers turn the scales at fifteen stone, while others are barely seven. It is unfair to bleed them to an equal extent. The maximum donation should be 420 c.cm., and some subjects are best cut down to 300 c.cm. or even less. In these days everybody is an allotment holder and a fire-watcher, in addition to doing more than an ordinary day's work. The bone-marrow tax, therefore, should not exceed 5–7% and it should be collected at the most convenient time for the taxpayer—after business hours, or on Saturday afternoons and Sundays.

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"Doctor, here's your hat!" A book of medical reminiscences was published by an American doctor a few years ago with this engaging title. I did not read the book for I knew that, for me, the title was all. How many times has my decrepit tile been handed to me with these words. A lady arrived at the nursing-home for her confinement with my hat among her luggage, and refused to return it to me until her baby was born. Black hats in her system of hagiology were lucky; even

my promise to find her a black cat in exchange was of no use. It had to be a hat, it had to be a black hat and it had to be mine. If this was my hat's strangest experience it has had another more humiliating. One of the difficulties that a doctor has about a hat is its safe lodgment in his patient's house. Too few halls are today decorated with a hat-stand or even a hat-rail. The hat, however, must be left in a position that is at once obvious and unobtrusive; the staircase lintel, if such there be, is the position of choice. "I will look in to see David again on Tuesday, Mrs. Jones," with one's hand travelling lightly down the banister, "I'm sure that by then we shall find him (ah, yes, this is mine," as one's hand comes directly against a familiar object) "very much better." Nothing could be more simple and one is on the doorstep, hat in hand. The lintel absent or inadequate, it is necessary to look around for another lodging. It was thus that I was one day searching a hall when I saw a coffin-like glass case in which fish of varied colours were swimming. I trustfully put my hat on the top of this miniature aquarium. I was mistaken, for its sixth and upper side was open to the air. My hat was rescued by the proprietor just before it completely submerged, and was returned to me with a goldfish inside. This problem will in any case be solved by the too swift passage of the summer, for the doctor who can put on his overcoat and leave his hat behind him must suffer from amnesia to an unusual degree. Three further clinical points about this interesting disorder. It must be of recent origin, since any late Victorian or early Edwardian physician who walked down the garden-path without his silk hat on his head must have suffered irreparable loss of prestige. Secondly, the malady is not entirely specific since it may embrace other objects; such as stethoscopes and ophthalmoscopes. Thirdly, in advanced cases the symptom may be displayed in unusual circumstances. A few days ago the gardener brought in a forage-cap which he had found lying at the foot of some raspberry-canes. He had his theories about this cap. One was that the cook, his friend, had been receiving the licentious soldiery in the summer-house; the other that the thieving, scrounging so-and-so's had been after his peas. My wife restored calm when she recalled that a few nights before I had put on my Home Guard uniform for the first time and had mowed the lawn in full kit to accustom myself to these unusual garments. The night was warm, the grass was long, the mower was stiff and I was sweating uncomfortably round the forehead. I discarded my convict cap. Thus a few days later it was held in front of me, a poor shrunken thing. "Major, here's your cap!"

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The autumn health publicity campaign of the Ministry of Health has begun, and great things are promised us. H. M. Bateman in his posters and Arthur Askey in his comedy film can be relied on to do their stuff, and there are to be window displays and talks by the B.B.C. But on the literary side, it seems, there is to be no high art, just three very plain statements hardly worth the name of slogans—"Coughs and sneezes spread diseases. Trap the germs by using your handkerchief. Help to keep the nation fighting fit." Not very lively, are they? And unless we use paper ones, which are scarce these days, it seems to me that our handkerchiefs will merely trap the germs temporarily and release them later on the unsuspecting housewife or maid at the wash tub. So as an unofficial Poet Laureate, spurred to action by grave current events, I submit the following metrical version which may point the way to saving a deserving life without mentioning any particular brand of disinfectant.

Coughs and sneezes spread diseases.
Trap the germ before it seizes;
Do not think our slogan cranky,
Wrap the devil in your hanky.
So you'll keep the nation fit,
Able then to do its bit,
Healthy, well and superhuman—
All except the washerwoman.

* * *

It surprises me that no peripatetic correspondent has commented on the unique position which the cigarette holds in these troublous times. Though it cannot be counted as foodstuff or munition of war it has gained for itself a special controller, a special commission to buy supplies from abroad, and a special place in the Lease-lend Act. I have read or heard the number of millions of cigarettes that are smoked every day and the thousands of tons of tobacco that are imported every year, but having no memory for figures I have made my own calculations. If, I said, one in twenty of the population smokes cigarettes (surely a modest estimate) and the average consumption per smoker per day is 5 cigarettes (again a modest estimate), then some 10 millions of cigarettes are smoked every day which at 1*s.* 6*d.* for 20 means £37,500 going up in smoke daily. Now, there is little doubt that the cigarette has become an integral part of our social system. It serves as introduction to strangers on a train journey; it breaks the icy awkwardness among distant acquaintances assembled for a meal; it is the hall-mark of the gentleman when the meal is over. If you cannot produce a well-stacked gold or silver cigarette-case, or worse still, if you refuse to have one from such a case, you are suspect for the rest of the evening. The cigarette relieves the monotony of a tedious day (many a man never smoked till he joined the army); it soothes the distracted mind; it allays the pangs of hunger; it may even, according to our scientists, disinfect the air we breathe. And when all its virtues have been extolled, we have to admit that smoking is but a bad habit—a habit which can usually be broken without detriment to the habitué, a habit which many folks never acquire and are none the worse for the lack of it. For some it is a form of worship which, like church-going, they cannot do without, but for most of us it is a self-indulgence which with a little effort we could well give up. We might even class the smoker with the road-hog who uses petrol for pleasure, but would that be hitting at the liberties of the British workingman? Some smokers defend themselves by pointing to the revenue which tobacco brings in, but in these days when every inch of shipping space is needed for commodities to beat Hitler that is a poor excuse. May I add that I confess to a sneaking envy and admiration of the pipe-smoker? The only thing about him that riles me is the time he wastes in filling his pipe. Now whisky is quite another kettle of fish; it is home-produced, is nine-tenths tax, and only the very rich can consume too much of it, so that to drink the stuff is a real act of patriotism. Being a Scotsman who has lately forsworn the weed, I am like to be overflowing with virtue and good spirits.

On the related subject of food, I'd put the "grow more vegetables" campaign among our few triumphs—so far—of this war. I don't know how much extra food it has produced, but it has sent many of us townsfolk back to the land to discover or re-discover the virtue of digging up mother earth. It has been a hobby and a mind-healer as well as providing the physical exercise that the indoor worker needs; it has also been a great leveller, giving employer and employee a common bond of interest. It has even supplanted "shop-talk" when members of our fraternity forgather. I wonder if they cultivate the allotment and vegetable patch in Germany.

BRITISH HOSPITALS ASSOCIATION

Sir Bernard Docker had a cheering statement to make at the annual meeting of the association on Oct. 24. For the first time the association is distributing money. As the agent of the Government it is remitting the 50% grant of the additional salaries being paid to the nursing staffs of the hospitals (*Lancet*, Sept. 6, p. 292). The council have adopted a statement of policy explaining the relationship between the association and the Nuffield Provincial Hospitals Trust, which is largely an attempt to define terms. Wherever practicable the term "coördination of hospital services" will be used instead of "regionalisation." The association is calling its erstwhile regions "areas" and will try to make their boundaries conterminous with those of the Nuffield "divisions." Areal committees will deal with the special problems of the voluntary hospitals apart from those they have in common with the council hospitals. Sir Bernard regretted that legislation had not put upon voluntary hospitals a share of the responsibility for providing hospital accommodation. Sir Bernard also spoke of the anxiety felt by many hospitals about the shortage of staff owing to the refusal of the Ministry of Labour to regard hospital work as war work. His remarks were strongly endorsed in the discussion which followed and it was even suggested that some hospitals might have to close because the necessary lay staff was no longer available.

Parliament

FROM THE FLOOR OF THE HOUSE

MEDICUS M.P.

IT was in the first year of this world war that I left the House, in June, 1940, to be precise, and it is in the third year of the war, in October, 1941, that I return to this column. Not that Service commitments kept me away from the House entirely—it is laid down in regulations that an M.P. shall get leave to attend to his parliamentary duties—but such visits as I could make were different. The House to which I return is different too. A Service colleague saying good-bye to me said, "Well, keep 'em up to it. We support the Government, but no-one is infallible." The House I left in 1940 had just rallied to the new Government to meet a mighty shock—the House to which I return in 1941 is remaking the forms and procedure of the House to meet the circumstances of a war in which Parliament is a chief of the forces fronting the enemy. There is active and constructive criticism. There is provision being made, for the first time in modern parliamentary history, for the taking of votes and recording the division of opinion when the House is in secret session. There is criticism of the somewhat clumsy expedient of an official non-Government spokesman speaking from the "Opposition" bench (which supports the Government) so as to carry out the "opposition" duties without which the parliamentary machine does not function. There is an incisive bite in many questions put to ministers in which a real opposition, in matters of detail, expresses itself. But out of details in Parliament spring principles on which Governments may be attacked.

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There have lately been several occasions in Parliament in which the voice of criticism has reached full opposition strength—but not an opposition on party lines. A debate on proposed changes in Service pay and dependants' allowances introduced by Sir Walter Womersley, Minister of Pensions, and supported by Mr. Wilfred Paling, the parliamentary secretary, was received with a unanimous chorus of fierce criticism from Labour, Liberal and Conservative alike. The House wanted a straightforward increase of dependants' allowances. The Minister offered an increase of grants to be made through the machinery of the Unemployment Assistance Board. This lining up of Army and other Service dependants outside the offices of the U.A.B. appealed neither to Viscount Hinchinbrooke in the uniform of a Midland regiment, nor to Miss Ward, a member of the War Grants Committee with an expert knowledge of all the details of the grants, nor to Mr. Dobbie, another member of this committee.

The Minister tried to bluff it out and his parliamentary secretary backed him up but, most astonishingly, Sir Walter Womersley said, in a broadcast the same evening, that the proposals were received by Parliament with "general approval." Chase my parliamentary secretary round the Speaker's chair—as Mr. Nat Gubbins, M.P., might say! Briefly this scheme for dependants was rejected by the mass opinion of the House on the ground that it was administratively unworkable and that it was unjust. The Minister still smiles about it in public—but behind the scenes desperate efforts are being made to evolve something more acceptable—and the House is not likely to be complaisant. And ministers can be changed if necessary.

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Another occasion was a debate on the refusal by Mr. Morrison as home secretary to allow Mr. McGovern to visit North and South Ireland. Mr. McGovern is a member of the Maxton party of three who are against the war but who state that they are anxious to do nothing to impede the war effort. One of Mr. Morrison's reasons for the refusal was that he did not consider that Mr. McGovern's visit to Ireland "would be helpful" to the national effort. But is it Mr. Morrison's business to decide that? It was argued, by the Conservative M.P. who brought the matter up before the House, that this was not Mr. Morrison's business—that it was essential to the M.P. to be as free and unfettered as possible in carrying out his duty as an M.P. The criticism of the Home Secretary by all parties in the House was so hostile that the Prime Minister had to come to Mr. Morrison's rescue. And there was an uneasy questioning about whether there was "any danger of a division," not in the House, but in the lobbies outside.

No matters of this kind touch on the House's support for the Prime Minister: he stands head and shoulders above all his ministers in the cabinet and out—indeed it is a pity some of them are not taller. As criticism develops—as a result of the revelations of the Gort dispatches, as a result of criticism with regard to British aid to Russia, and as a result of other matters which crop up—individual ministers' reputations may be damaged and they may even be dropped. But the Prime Minister strengthens his hold on the House.

* * *

One disadvantage of the McGovern debate was that it cut down a debate on the health of the nation to a half-day. Mr. Ernest Brown had recently made a statement on the inquiry to be held on the relations of voluntary and publicly controlled hospitals in the future. A useful piece of work, but not of priority importance at the moment. Medical man-power, the rise of tuberculosis and its relation to the conditions of war-production, and existing epidemics of typhus in Europe are all of greater urgency. The interim report of the Shakespeare committee on medical man-power, which has been written but not published, is known to be a purely interim proposal for the setting up of regional committees. The setting up of a method of close coördination of all branches of medical work in the war will need to be pursued by other and more vigorous means if this is to be effective. One of the speakers in the debate was Prof. A. V. Hill, who spoke in favour of a state medical service without defining the machinery of the service. The B.M.A. Medical Planning Commission, PEP, medical and health committees of other organisations and much discussion in committees in and around Parliament are all considering the problem of the health and medical service of the nation. And in the new parliamentary session—the present session is ending shortly—a larger scale debate on health and medical questions is to take place.

It is hoped that this debate will give opportunity for consideration of the health aspect of food rationing, of the increase of health services in war factories and generally of how to keep the nation—as one member said in the last debate—fighting fit for the work of production.

Our Nutrition Policy

In the pleasantly informal atmosphere of the luncheon hour, on Oct. 21, Lord LISTOWEL in the House of Lords gave the Government an opportunity to describe how they were safeguarding the children's food in war-time. The problem was not controversial but it was urgent. The Government's milk scheme and school meals were our new antidotes to poverty and malnutrition, and Lord Listowel hoped they would become no less permanent a feature of our social services than free education. Indeed teachers have discovered that a school meal is a practical demonstration of character training and dietetics, and is as valuable as regular classes or organised games.

Lord WOOLTON said that war had altered the whole nature of the nutrition problem. As a result of the equalising effect of the ration book the nation was living on a diet which was based on the average needs of the family. But it was not designed to meet the needs of special classes of the community and there was some danger that those who required special consideration, either for the growth of their bodies or for the maintenance of more than average physical strength, might find the ration-book diet insufficient. At present there were 5 million children in the elementary and secondary schools and only 300,000 were receiving meals in school. The provision of school meals was uneven: in a few areas, as much as 30% of the children were having meals in school, in others there was little or no provision. Not all local authorities had realised the implications of the war-time diet scale, and there was no doubt that many had met with difficulties regarding equipment, premises and finance. Yet in some areas up to 50% of the parents would like their children to have dinners in school, and are willing to pay for them.

The Chancellor of the Exchequer had now agreed that from Oct. 1 the grant in respect of the provision of meals

for children attending public elementary schools was to be increased by a further 10%, with an overriding maximum of 95% of the loss incurred. The minimum rate of grant would now be 70% and the average rate approximately 80%. Priority supplies would be provided to enable school canteens to serve balanced meals of the type which medical and scientific advisers considered necessary for the growth and health of school-children. These provisions would apply to all schools. The cooking depots for use in emergency, which had been set up by local authorities and were now lying idle, were to be brought into action now, and kept bright and polished in the daily service of the children of the nation. They were capable of providing 300,000 meals a day, and the number would be increased to 400,000. British Restaurants and emergency meal-centres would also play their part, and their equipment, subject to suitable safeguards, would be used, and where it was necessary to start new kitchens equipment would be available from the Ministry's pool. The President of the Board of Education was seeking to raise the proportion of children receiving milk under the milk in schools scheme from the present 60% to as near 100% as possible. To this end the whole cost of providing free milk to necessitous children and handling the milk in the schools would be reimbursed by the Exchequer.

So much for children. But, Lord Woolton pointed out, we have not only to preserve life but to defend liberty. The principle adopted to secure the health of children—to see that they should be fed where they were congregated—had also been adopted for industrial workers. Canteens would be divided into three groups, according as they catered for the heavy worker, the medium-heavy worker and the sedentary worker, and the Government would provide the appropriate food accordingly. Before the end of this year 85% of the mining population would have a supplementary ration served at the pit-head.

Lord HORDER, in welcoming the Minister's statement, said that so far no overt signs of malnutrition were to be seen among our people, but if we delayed until malnutrition appeared we might have waited too long, for malnutrition left a permanent scar. Evacuation had undoubtedly acted as a deterrent against deficiency diseases in children, because sun and air were essential in preserving nutrition. But we did not know how far our children might be from malnutrition; for science could not measure the margin of safety. Children were at the mercy of chance in any rationing scheme, for with most mothers knowledge marched a good way behind affection, and school was the only place where defects might be made good and hazards warded off. He felt that this was a red-letter day in the annals of children's nutrition. Everybody must help and they must aim at as many meals as possible in as short a time as possible.

The Battle of the Books

The Minister of Information lately said that ink has done much to sustain and improve the modern social system. It is the staple of freedom, knowledge and entertainment. But ink can do nothing without its colleague paper, and Lord SAMUEL received warm support in the House of Lords on Oct. 23 when he pleaded for some indulgence for the publishers of books. Noble Lords seemed to feel that paper-saving might well begin in Whitehall. Entertainment and education are part of our war effort and the public are seeking both today from books in a greater measure than ever before. Libraries and universities are unable to obtain school books and technical books which they have ordered, and Lord HORDER sent a message to say there is an urgent need for the release of paper for printing books for the doctor, the medical student, the nurse and the civil defence worker. He gave as an example from his own knowledge an excellent book on first-aid which is out of print and cannot be reprinted for lack of paper, and added that the "chaotic state" of the printing and binding trades are causing from 4–6 months' delay in the publication of what books there is paper for. Knowledge of science could not be maintained unless there are books to feed it. Lord SAMUEL pointed out that the paper used for books is obtained from home sources and is only 1·5% of what the country uses for other purposes. We must concentrate on the war, but what are we fighting for, Lord Samuel asked. We are fighting for the intellectual and spiritual things which we value and it would be a tragedy if they were to be trodden under in the fight. The Archbishop of CANTERBURY held that we cannot be effectively at war unless we are sometimes prepared to get outside it and above it, and for many books were the easiest means. Restriction of paper unfortunately by no means meant that only the best books were published. Lord ESHER thought that the publishers had perhaps not done all they might to solve their labour problems. Lord ELTON said that the books we exported project Britain abroad, and declared the least pretentious book was a better form of escapism than alcohol or astrology. He warned his listeners that a too severe restriction of paper might easily slide into a kind of censorship. Lord SNELL replied for the Government regretfully, but said the book trade had received more favourable treatment than newspapers or periodicals. He admitted his own indebtedness to books and looked forward to the day when they would once more provide unrationed nurture for our times. Lord SAMUEL thanked him for the spirit rather than the substance of his reply and acclaimed him as a literary Doctor Jekyll and an official Mr. Hyde.

QUESTION TIME

School Meals in Scotland

Replying to a question Mr. T. JOHNSTON said: I hope to secure an immediate and substantial development of school meals service by arranging for advantage to be taken of facilities provided by the Minister of Food, and where these are not available by encouraging education authorities to make their own provision. The financial aid available to education authorities is being increased. Parents who are able to pay will be expected to pay. Scots Law presently permits food to be provided for necessitous children only when the child is unable by reason of lack of food to take full advantage of the education provided. But malnutrition should be prevented, and a short bill, designed to give education authorities power to supply food free of charge to necessitous cases without waiting for evidence of malnutrition, will be introduced in the near future.

Tuberculosis in Scotland

Mrs. A. HARDIE asked the Secretary of State for Scotland in what districts in Scotland the increase in notified cases of tuberculosis had taken place.—Mr. JOHNSTON replying gave the following figures:—

1938			1939			1940			1941 (first 41 weeks)		
Pul.	Non-pul.	Total	Pul.	Non-pul.	Total	Pul.	Non-pul.	Total	Pul.	Non-pul.	Total
4793	2772	7565	4657	2440	7097	5200	2504	7704	4548	1988	6536

Pul. = pulmonary.

Infant Mortality in Scotland

The latest infant-mortality figures available for Scotland are those for the first six months of this year. Comparing these rates with the average of the rates for the first six months of the three years 1937, 1938 and 1939, the burghs showing the largest percentage increases are Dumbarton, Rutherglen, Hamilton and Paisley. Considerable increases are found in the counties of Nairn and Sutherland, but the small number of births in the first six months of 1941 renders any comparison unreliable. (Mr. JOHNSTON replying to Mrs. HARDIE.)

War-time Nurseries in Scotland

Ten local authorities in Scotland have submitted definite proposals for the establishment of war-time nurseries, and these proposals, which provide for 39 nurseries, have all been approved. Of the 39, there are 2, each accommodating 40 children, in full operation, and 14 which were already in partial operation at the date of the circular are being brought into fuller operation. (Mr. JOHNSTON replying to Mr. MCNEIL.)

Deaths after Vaccination

In reply to a question the MINISTER OF HEALTH stated: the deaths of children under five assigned to vaccination numbered 5 in 1938, 1 in 1939 and 6 in 1940; but I am advised that this classification does not rule out the probability that such deaths may have had other contributory causes.

Registrar-General's Reports

Sir ERNEST GRAHAM-LITTLE asked the Minister whether he would secure the resumption of publication of the Registrar-General's Reports, cessation of which constituted a serious handicap on medical research, and was successfully avoided in the last war.—Miss F. HORSBRUGH replied: The preparation of these reports has not been discontinued, though it is regretted that war-time conditions have delayed the completion of the report for 1939. It has been decided, however, to print in the first instance a very limited edition of this volume which will be held by the Registrar-General and made available for consultation and study by Government departments and other bodies or persons having an acknowledged interest in its contents. The interests of medical research will receive sympathetic treatment under this arrangement.

Doctors for Pensions Appeal Tribunals

Mr. W. W. WAKEFIELD asked the Minister of Pensions if, in view of his recent undertaking that he would consult the Minister of Health as to the supply of doctors for pensions appeal tribunals, he could now state what was the present position.—Sir W. WOMERSLEY replied: I have stated that I shall keep the matter of pensions appeal tribunals constantly in mind in the light of the findings from time to time of the Shakespeare Committee. I am asking that committee to give me their views on the availability of suitable doctors for appeal work.

Hospital in Antigua

Dr. H. B. MORGAN asked the Under Secretary of State for the Colonies whether the Colony Hospital in Antigua, British West Indies, was still in the state it was in February, 1939, badly in need of repair, with rotten floors, leaking roofs, broken doors and poor sanitation; whether temporary repairs had yet been done; and when it was proposed to rebuild the hospital properly so that good medical work for the island inhabitants might be done.—Mr. G. HALL replied: Owing to the financial position of the colony it has only been possible in recent years to effect the minimum running repairs to the Holberton Hospital in Antigua. The question of rebuilding the hospital, which is agreed to be necessary, has been considered by the comptroller for development and welfare in consultation with the governor. Plans will be drawn up by a qualified hospital architect now in the West Indies. This architect will shortly be undertaking a survey of hospital buildings in the Eastern Caribbean colonies and British Guiana, financed by a grant under the Colonial Development and Welfare Act.

Medical Board Rejects

Sir ROBERT YOUNG asked the Minister of Health whether he was aware that many men were turned down for the various forces by the medical boards on account of physical disability, and placed in class III or IV; and whether he would consult with the War Office, in the interests of the future health of the nation, so that each man should be informed of his particular physical disability, when if it was anything requiring attention he could consult his own medical doctor or officer.—Mr. E. BROWN replied: I will communicate with the Minister on the matter.

BEE STINGS.—Mr. S. B. Ralston of Bearsden, Dumbartonshire, writes: I have worked with bees for some 20 years, using a veil but with bare hands, and therefore have a large experience of stings. A moderate number of stings have little effect, except a slight local redness and later itchiness, with no swelling; but 20–30 stings have had a more severe effect, and recently even fewer than 20. The effects are, successively: (1) a feeling of heat and stuffiness inside the veil; (2) increasingly heavy pounding of the heart; (3) rush of blood to the head, with bloodshot eyes; (4) a sick feeling but no vomiting; (5) giddiness tending towards momentary unconsciousness; (6) gradual recovery with profuse perspiration; (7) nearly full recovery in about two hours. The attack itself seems to take a long time, but actually is only a matter of minutes. The procedure I adopt is to lie flat on my back with my head slightly raised; I do this at once in the garden, but well away from the hive. Then when the giddiness is over I go indoors and take a warm bath and get a very necessary change of clothing. Finally I sleep for an hour or two.

Letters to the Editor

MALNUTRITION IN THE COLONIES

SIR,—You have drawn attention to the subject of planned nutrition for our Crown Colonies in your leader of Oct. 4, and I hope you will go on turning a kindly eye on this subject for the benefit of the less well informed at home. Little was really done before the war, though the Moyne Commission brought out the appalling state of nutrition in the West Indies, one of our oldest colonies. In Africa, medical development has largely been due to the keenness of individuals rather than to a defined nutritional policy. This is borne out by the dearth of nutritional appointments and of postgraduate training facilities, and by the lack of standing committees directed to the study of nutrition. Nor have educated Africans taken much share in a problem which is primarily their own. A more active policy was being foreshadowed at home before the war in the Colonial Advisory Report no. 1. Report no. 2, which was that of the colonies themselves, showed how little active concern for nutrition they had displayed up to that time. The work of the Medical Research Council, Dr. Platt's visit, and the proposal to establish research scholarships before the war all show awakening interest. Credit for what has been done so far, however, must go largely to men like Stannus, Lowenthal, Pillat and Wilson, who spent the greater part of their lives in Africa and contributed much of what is known about tropical malnutrition. They knew their environment and the people they lived among—essential preliminary knowledge for most research in Africa, since Africans are shy of inquirers until they know and trust them. The Alfred Jones Laboratory was an excellent example of the value of continuity, but is now closed down. If nutrition is to be tackled seriously in our tropical possessions this can best be done by men who live there. Its study needs a director and whole-time staff and the same backing as that given to the sleeping-sickness campaign in recent years. Most of the medical advisers at home and the directors of medical services in the colonies have had a greater interest in medicine and hygiene than nutrition; there have been few Sir Thomas Stantons. We need permanent nutritional departments at home and in the colonies, staffed by men who are not only qualified for the work but are vocationally interested in it.

Moreover, colonial nutrition is judged from too narrow an angle. What collateral partnership is there between the study of nutrition and research in agriculture and fisheries, veterinary science, animal and plant nutrition? It is the job of agriculturists to improve the cereal crops which are so badly needed in Africa, to check the growing of uneconomic crops, to prevent soil erosion, and to fight pleuropneumonia and rinderpest in cattle. To the Africans agriculture has always appeared as a child of the political administration and its potentialities have never been recognised. There has been little constructive attempt to create interest in nutrition; few know, for example, that Kew Gardens introduced new foods and the first orchard crops to Africa. In many cases those orchards have been left desolate, or have become local botanical gardens, merely decorative and no longer serving the purpose for which they were intended. Lack of continuity is responsible; Kew is forgotten and unhonoured by the present generation in Africa.

Essential partners in African malnutrition are the venereal diseases. Gonorrhœa is endemic and widespread and is responsible for the bulk of physical unfitness among recruits, for much lost labour and for shortened expectation of life. It is as much a disease of poverty and ignorance as leprosy, but instead of being of Biblical antiquity it has come with the changing world we have created for Africa—with our trade development and with the breakdown of old laws which have been replaced only in part by new ones. Even today we can do relatively little for lepers; but for gonorrhœa we now have specifics and could do much.

Perhaps after the war we shall hear more about the colonial research fund; and perhaps more research facilities will be given to Africans and those whose interest is in the country. Since war broke out we have

been actively concerned about problems of subnutrition at home. In our colonies, which have been so generous to us, gross malnutrition is rife in peace as well as war.

Parkstone, Dorset. D. FITZGERALD MOORE.

STUDENTS ADVISE THE PRIME MINISTER

SIR,—As signatories of the telegram to which Sir Ernest Graham-Little refers in your issue of Oct. 25, we fully realise that few have the knowledge to advise the Government on problems of pure strategy. But surely everybody has the right to express his opinion on the general policy which he thinks the Government may be pursuing, or which he wishes it to pursue. For the state of public opinion must be a consideration of some weight with the Government in coming to a decision, and the expression of such opinion is a democratic privilege which is not lost once the citizen's vote has been cast.

ISAIAH MORRIS. JUDY WATERLOW.
CYRIL RUBEN.

University College Hospital Medical School.

SIR,—I trust that Sir E. Graham-Little will not lay the flattering unction to his soul that he has disposed, by his letter in THE LANCET of Oct. 25, of the 63 students who sent to him and to the Prime Minister the telegram urging more effective British intervention to help Russia. In the first place his analogy of the surgeon performing an abdominal operation is far from convincing. Unexpected conditions are assumed to be discovered on opening the abdomen which may make the completion of the operation immediately fatal. The surgeon pauses, and the implication is that he is pained and surprised when the onlooking students call upon him, even shout at him, to do something. Why shouldn't they? He gives no explanation to the students of his inactivity. Does he expect them to remain indefinitely mute with acquiescence or admiration at his paralysis, which seems to them to be anything but masterly? After all, a pause from June 22 to the present date seems to be an exceptionally long time under the circumstances. Perhaps also—leaving the analogy aside—some of the students have read Mr. Lloyd George's "War Memoirs" and have developed a healthy scepticism about both politicians and military experts in consequence.

Secondly, Sir Ernest seems to be unaware of the undemocratic tendency implicit in his argument. If we are told to leave every decision to the "unfettered and consummate judgment" of any one person, this simply amounts to dictatorship. On the other hand, criticism and discussion are the essence of democracy and if the authorities keep back important facts they must not be surprised if criticism falls short in certain respects. They will, of course, in these circumstancesal ways be in a position to denounce such criticism as ill-informed—a useful dialectical weapon often used as a defence-mechanism, as shown by the extent to which they tend unnecessarily to hold back information even, in some cases, until after the enemy has published it.

The 63 students are not the only people in this and other countries who are gravely concerned at our apparent failure to take more energetic action to help Russia, as Sir Ernest will know if he happens to read the papers. There may be good, if obscure, reasons for this policy. But I hope they are better reasons than those given in Sir E. Graham-Little's letter.

Harley Street, W.1. FREDERICK DILLON.

EVALUATION OF NUTRITIONAL STATUS

SIR,—At the inaugural meeting of the Nutrition Society more time could perhaps have been profitably spent on discussing measurements of the growth-rate of children as an index of nutrition. In a recent survey I examined 4000 children in different parts of Great Britain for signs of malnutrition, some both before and after dietary additions. As a result I believe that in assessing the state of nutrition in children measurements of the rate of growth are still the most sensitive index. Animal experiments strongly suggest that any dietary deficiency, or combination of deficiencies, will be revealed by a decrease in the rate of growth. Conversely, in human feeding experiments in this country measurements of growth increments are the only observations that have plainly and unequivocally demonstrated the effects on children of an improved diet. In using this nutritional yard-stick frequent measurements of height and weight over as long a period as possible should be taken; single measurements are almost useless. Further, it is essential to compare a child's growth curve with *contemporary* average curves, which should if possible be optimum curves derived from the best fed groups in the population. Alternatively, average height and weight tables from the recent reports of chief school medical officers of the large cities may be used. We know now that the stature of children is not a fixed natural characteristic for a given age but may be altered by varying the environment. For example, since 1920 the average height of 12-year-old Leeds elementary-school boys has increased by 2 in. and their weight by 7 lb.

Assessing the nutritional state of adults is far more difficult. The epiphyses are fused and no longer may cubits be added to our stature. Short of frank deficiency disease we have to rely on a close examination of those tissues which reveal signs of a defective diet most readily—the skin, mucous membranes, eyes and blood. These observations are not easy to make and their significance is sometimes disputed. Perhaps the best index of the state of nutrition in groups of adults, in populations free from frank deficiency disease, would be the changes in incidence of chronic bacterial infection, especially of the respiratory system.

The effect of certain other physiological systems which exert a powerful but subtle influence on nutrition should be borne in mind when assessing nutritional status. Abnormalities in the psychological system, especially anxiety, may prevent the proper utilisation of ingested food. Disorder in the endocrine system—for example, hyperthyroidism—may cause wasteful utilisation of food. Malnutrition may result from bad ventilation or excessive fatigue owing to anoxæmia and lactic-acid accumulation interfering with cell nutrition. Lastly, malnutrition may be due to unsuspected organic disease.

I raise these points in order to re-emphasise the great complexity of assessing the nutritional status and dietary requirements of man. Although the great bulk of malnutrition and deficiency disease can undoubtedly be abolished by improving people's diets, there are certain additional factors which complicate the problem. For practical, as distinct from experimental, purposes, I think it would be of most value to concentrate on watching the growth curves of children and the resistance to infection of adults as the surest indication of trends in the nutritional status of the population.

Royal Hospital, Sheffield. JOHN PEMBERTON.

BLAST INJURY OF THE LUNGS

SIR,—I am sorry that Dr. O'Reilly and Dr. Gloyne have marred their interesting account of blast injury of the lungs (*Lancet*, Oct. 11, p. 423) by such a complete mis-statement of my "views" on the subject. I have never suggested that "blast injury is best marked in the phrenico-costal sinus." Their quotation (*Brit. med. J.* 1941, 1, 510) should be "Certain parts of the lungs are predisposed to injury. Thus we find subpleural 'rib markings,' injury in the phrenico-costal sinus region, and deep and posterior lesions in the region of the hilus." If they will refer to the *Lancet* of Aug. 16 (p. 198) they will see this in diagrammatic form.

I do not contend that "since they [i.e. blast injuries and contusions or crush injuries of the chest] are so often found together they should be described together," but I do contend that absence of signs of violence to the chest wall means little or nothing. There may have been no usual form of violence to the chest wall or a lorry weighing 6 tons may have passed right over it; I have this conclusively proved with police photographs and post-mortem findings. Conversely the presence of signs of damage to the chest wall does not mean that lung lesions found are not wholly or in part due to blast. I have seen on a number of occasions how, especially in elderly people with rigid chest walls, there may be extensive fractures of ribs but no lung damage. So far no real pathological or clinical distinction has been shown to exist between cases of pulmonary concussion from (*a*) mechanical causes such as road accidents, (*b*) bomb explosions, and (*c*) depth-charge explosions, &c. One outstanding feature is the ease with which the lung lesions can be overlooked, either because they give

few symptoms or because their symptoms are wrongly ascribed to other lesions present.

The phrenico-costal sinus contusion was stressed because I feel it is proved that this lesion has an abdominal component to the force causing it, it therefore serves to direct attention to the fact that the abdomen is compressed with the chest—Dr. O'Reilly was so much confronted with this aspect that two of his cases had the abdomen opened. I fancy his fig. 2, the radiogram of case 3, shows a phrenico-costal sinus contusion (these radiograms are of such general interest that it is a great pity they were reproduced as positives instead of negatives—they compare very unfavourably with those of Dr. Deaner on the previous page).

The interpretation of the lung changes in any particular case may be so difficult that it is easy to understand them being described as just irregular. This is especially true of cases dying some time after the injury when acute pulmonary œdema may complicate the picture. Some degree of acute pulmonary œdema is the rule in these cases and the more hæmorrhagic forms of this may mimic the deep and often massive hilar contusions (these can be regarded as the contre-coup lung lesion). The action of morphia in preventing the onset of acute pulmonary œdema suggests that Dr. O'Reilly was very wise to use it freely in his cases; the similar action of some anæsthetics indicates that perhaps the dangers of anæsthetics in blast cases has been exaggerated. Since acute pulmonary œdema is benefited by venesection each case should be given careful thought before plasma-transfusion or the like is used.

While I agree with Dr. O'Reilly and Dr. Gloyne that the importance of making a diagnosis of blast injury of the lungs is great I do not believe that it is any greater than making a similar pathological diagnosis in road and other peace-time accidents—cases which are almost regularly treated with complete disregard for the lung lesions.

Derbyshire Royal Infirmary. G. R. OSBORN.

CEREBRAL HÆMORRHAGE IN AN INFANT BORN BY CÆSAREAN SECTION

SIR,—The morbid findings in an infant, which Dr. Lapage (*Lancet*, Aug. 9, p. 160) attributes to some constitutional factor such as deficiency of vitamin K, are of great interest on account of their strong resemblance to what is seen in patients with infective endocarditis who have been treated by a combination of heparin and sulphonamides. This treatment which appears so attractive on theoretical grounds has been associated with fatal cerebral hæmorrhage in a proportion of cases and the brain at autopsy often shows diffuse extravasation involving particularly the white matter of the cerebrum so that large areas are converted into a hæmorrhagic jelly. Elsewhere there are hæmorrhages on a smaller scale and having a distribution similar to that described by Dr. Lapage. The similarity of the pathological findings in the two states is a point in confirmation of the suggestion he puts forward regarding an alteration in the clotting power of the blood.

London, S.W.3. J. H. MULVANY.

FOOD ADVICE FOR THE WAITING OUTPATIENT

SIR,—The part which doctors and nurses play in aiding the national food policy is at present small because nutrition is a matter on which they are seldom consulted by their patients except in cases of illness, and then it is more often the special diet than the general aspect that arises. In spite of the efforts of the Ministry of Food that are everywhere apparent and applauded, enlightenment on the best food to buy within the restricted choice available and the most beneficial methods of cooking it are limited because the ministry lacks the means of reaching the housewife by personal contact. A great opportunity to overcome this difficulty exists in the outpatient departments of hospitals and in the maternity and child welfare clinics throughout the country where hundreds of thousands of women congregate daily. The initiative to exploit this opportunity should come from those responsible for the hospitals and clinics.

At Soho Hospital for Women we are attempting to give advice on food and cooking to a minute fraction of this large group of the population. We have been enabled and encouraged to make the experiment by the good offices of Dr. B. S. Platt of the staff of the Medical Research Council and by the coöperation of the London County Council who have been so good as to give us the services of one of their expert advisers on domestic economy and cooking. This lady comes to the outpatient department once a week, and having made a typical housewife's daily food purchases on the way demonstrates their uses and abuses. This is not done in a formal lecture, which would prolong the outpatients' wait and discourage them, but in talks to a few patients at a time before or after they have been seen by me.

The demonstrations are proving popular and the patients and their friends have expressed their gratitude for the service. The secretary of the hospital will be very pleased to show the scheme in working to anyone who is interested and will communicate with him.

London, W.1. W. C. W. NIXON.

MEDICAL ASPECTS OF BOXING

SIR,—Supposing that boxing has all the disadvantages claimed by Dr. Jokl, which I would not admit, the advantages obtained by it far outweigh them, especially for men in the fighting forces. These are courage, pugnacity, endurance, activity, quick wittedness, and general physical fitness. Far more numerous and serious injuries are incurred in football. I think Dr. Jokl must have the anti-blood-sports mentality. Of all the blood-sports boxing is certainly the bloodiest.

Kimberworth, nr. Rotherham. G. E. MOULD.

ENURESIS

SIR,—In your issue of Oct. 18 Dr. Greene gives us a somewhat turbid criticism of Mr. Winsbury-White's valuable article on Enuresis. This criticism cannot merit any serious reply if for no other reason than that he uses this quite senseless expression: "It would be interesting to know how he *differentiates* these *apparently opposite* groups" in relation to two quite well-known and distinct classes of upper urinary tract dilatation which are clearly and reasonably explained in the author's text. Further, he makes the dogmatic statement that Bartholin's glands do not open into the urethra. I should be glad if he would produce for me any material evidence he has in his possession which proves this assertion.

Guildford. DONALD MACLEOD.

RADIOLOGY AS A CAREER

SIR,—I should like to endorse the remarks of "D.M.R.E." That there is no shortage of radiologists is surely borne out by the fact that only about three advertisements for one have appeared since the beginning of the war, three offering a living wage at any rate. It is pretty generally admitted that the future of radiology will be in the hands of full-time men in the hospitals. Apparatus and running costs are so expensive that proper examinations will soon be prohibitive in private. Yet there cannot be a dozen such appointments in Great Britain.

The difficulties of radiology as a junior specialty, mentioned by your correspondent, are due mainly to the general staffs of hospitals who still think they know all about it and teach their students that all radiologists are bad. They insist on having their work done as and when they wish, giving no chance of organisation to departments whose work is doubled and apparatus halved, and whose coat of arms should be Æsop's man and son and donkey. Hospitals will have to face the facts and put in men at worth-while salaries and let them be masters in their own houses. Otherwise there will be a shortage of good men, who will not take the present pay and status of technicians. The scheme of subsidising half-trained men is typical of the present attitude and will ruin radiology for a generation.

D.M.R.

HYDATIDS IN BRITAIN.—In referring to Dr. Nicolson's paper of June 21 on a pelvic hydatid cyst and the annotation on peritoneal hydatids in the same issue Sir Louis Barnett writes from Hampden, New Zealand: Hydatid disease is not so rare in Britain as many people think. My personal investigations showed that practically all the large hospitals record a case or two every year, and the Registrar-General's mortality returns are not insignificant.

Obituary

H. E. G. BOYLE

O.B.E., F.R.C.S., D.A.

Henry Edmund Gaskin Boyle was born in Barbados and was educated at Harrison College there before coming to England where he qualified from St. Bartholomew's Hospital in 1901. While a student he was president of the Abernethian Society and after qualification he held the post of casualty officer at the Bristol Royal Infirmary. He then returned to Bart's as junior resident anæsthetist, rising in due course to be head of the department. When he began his life's work the "rag and bottle" methods were universal, but about 1912 the work of Hewitt in this country and Boothby and Cotton in America put gas-and-oxygen on the map and Boyle was quick to grasp its possibilities. In the last war he was instrumental in getting the army authorities to realise the importance of the new anæsthesia in shocked patients and the dispatch of his portable apparatus to casualty clearing stations in France undoubtedly saved many lives. For these services he was made O.B.E. Boyle made a visit to the United States to see for himself the progress of anæsthetic technique. While there he was struck by the value of the Davis gag for dissection tonsillectomy, and on his return he introduced it to British ear, nose and throat surgeons. He was also one of the pioneers of intratracheal anæsthesia. In 1935 the Royal College of Surgeons elected him a fellow and in the same year he received the new diploma in anæsthetics. He was one of the first pair of examiners for this diploma and his fairness and acceptability were widely acknowledged.

For over 40 years "Cockie" Boyle could be seen nearly every day at Bart's and the number of students who benefited by his practical teaching was enormous. He also held anæsthetic appointments at Paddington Green Children's Hospital and St. Andrew's Hospital, Dollis Hill, and had a large private practice. He was not a ready writer, but he contributed now and then to the medical papers and published with his colleague Mr. C. Langton Hewer "Practical Anæsthetics" which reached a third edition.

Boyle was by nature extremely kind and he had hosts of friends. "To an anæsthetist who met him only outside hospital, the characteristics which most impressed me in him," J. B. writes, "were his joviality, a slightly sardonic sense of humour, readiness to speak at a meeting, and general level-headedness. Boyle's earliness in the field with an efficient and not too complicated gas-and-oxygen machine, in the days when that form of anæsthesia was rapidly being established after the last war, has earned for him a lasting name among the anæsthetists." He took a deep interest in student activities, and was a familiar figure in the stand at Richmond for the rugger cup ties. His own sport was cricket and he often displayed his skill in the matches between past and present Bart's men.

In 1910 he married Mildred Ethel, daughter of J. W. Wildy and widow of Mr. Leslie Green, F.R.I.B.A. His health had been failing for some years and he died on Oct. 15, aged 66.

DAVID ORR

M.D. EDIN.

THE sudden death of Dr. David Orr on Oct. 8 at his home in Edinburgh came as a shock to his friends, for he had just returned from a holiday and seemed to be in good health. David Orr was born in 1872 and educated in Edinburgh at George Watson's College. He qualified in 1894 from the university, and in 1902 was specially commended for his M.D. thesis. After qualifying he studied diseases of the eye in London at Moorfields Hospital, and for a time was clinical assistant in the ophthalmic wards of the Edinburgh Royal Infirmary. From postgraduate studies at Heidelberg and Vienna he returned to Scotland to work with Clouston at Morningside, then at Melrose Asylum, and later he held the post of assistant pathologist to the laboratory of the Scottish asylums. In 1898 he was appointed assistant medical officer and pathologist to the Prestwich Asylum, Manchester, and was promoted deputy superintendent in 1911 and medical superintendent in 1924. Unfortunately his health broke down the following year, and he retired to Edinburgh, where he resumed his research in the laboratory of the Royal College of Physicians.

Orr was an indefatigable worker, and during his time as pathologist at Prestwich he published important papers dealing with the pathology of acute insanity, the influence of toxins on the central nervous system, and the paths of infection through the lymph-stream in the spinal cord. He was familiar with the German, French and Italian literature of his subject, and visited the continental clinics and laboratories. In 1909 with R. G. Rows he published a translation of Lugaro's "Modern Problems in Psychiatry." No-one who worked with him will forget his vivid personality and buoyant enthusiasm. He carried with him "the infection of a good courage" and so could "meet all life's ills and accidents with gallant and high-hearted happiness." His main interests outside his work were golf and music. He sang well and had a fund of good stories, and an evening in his hospitable home was something to be remembered.

He leaves a widow and two daughters.

HASTINGS GILFORD

F.R.C.S.

Mr. Hastings Gilford died at the age of 80 on Sept. 6 in Reading where he had set up in practice in 1887 soon after qualifying from Guy's. He continued to practise as a general practitioner to the end of his life and many families recognised his skill as an accoucheur and his devotion to children. But his consulting practice, both medical and surgical, was also growing—he had taken his fellowship in 1889—and in due course he became surgeon to the Reading Dispensary and during the last war to the Sutherland Hospital for Pensioners. With his seeking mind it was inevitable that he should gravitate to the Reading Pathological Society and he read many papers at their meetings. Though most of his contributions were surgical he was a pioneer in the study of the ductless glands and his classic paper on progeria was published in our columns (1914, 1, 672). These investigations led him to the study of cancer, and most of his later writings were a challenge to experimental research, for he contended that cancer was not caused by an outside agency acting on the cells but by a disorder of the cells themselves stimulated by civilised man's unnatural ways of living. In "Postnatal Growth and Development," published in 1911, he put forward the thesis that development begins with the integration of the cell, which continues with increasing complexity and diminishing impetus up to middle age, then merging into declining phases in which this process is reversed. His Hunterian lectures in 1913 dealt with the nature of old age and cancer from this standpoint. He continued his studies of the biological and clinical aspects of the subject and "Tumours and Cancer" appeared in 1925, and he also contributed forceful letters to our columns. Later under the name of John Cope he set out his views for a wider circle of readers. With this bias towards distrust of the conventional Hastings Gilford combined a disarming humility and a receptiveness to the lessons of experience that made him good company for young and old. He took much from the town of his adoption and gave more in return.

Gilbert Adams, Reading

Mr. G. STAFFORD ALLEN, who died suddenly in London on Oct. 22, aged 70, was partner in Stafford Allen and Smith Ltd. of Long Melford, Suffolk, medicinal herb growers. Interest in herbs and gardens was traditional in the Quaker family to which he belonged and he was equally at home in fruit-growing, agriculture and pedigree pig breeding, while his hobby was the rock garden. He was a trustee and manager of the Ogilvie school of recovery at Clacton.

Medical News

University of Oxford

On Oct. 16 the degree of D.M. was conferred in absence on Eric Smith.

The Rockefeller Foundation is making a grant of £1000 to the university towards the cost during 1942 of research on the growth of and regeneration of nerves to be undertaken by Mr. J. Z. Young in the department of zoology and comparative anatomy.

University of Glasgow

On Oct. 18 the following degrees were conferred :—

M.D.—* H. C. McLaren (with commendation) and C. H. Wilkie.
* In absentia.

M.B., Ch.B.—J. S. Frew (with honours); T. A. Berry, N. C. Scott, John Gilchrist, W. A. Maclure, Wallace Barr, A. W. McLeod, W. B. Newton, Agnes D. D. Murray, and John Renwick (with commendation); F. O. Adewole, A. B. Aiton, W. A. M. Akiyemi, J. M. Alexander, W. H. N. Angus, Robert Auld, A. C. Barry, S. G. A. Bartlett, C. K. Boal, Andrew Bowman, R. D. C. Brackenridge, O. M. Brewster, C. H. Brown, Johanna J. S. Brunton, Walter Burnett, W. F. Caldwell, Janet A. Christie, Thomas Cochrane, H. B. Cowan, G. M. Cubie, J. T. Cunningham, P. N. Cunningham, T. M. Curran, C. C. Cuthbert, Jean W. Cuthbert, J. K. M. Deas, W. A. Dewar, T. M. Donald, W. A. J. Donald, P. A. Duke, R. I. Shaw Dunn, R. L. Ewing, C. S. Farquharson, Hugh Ferguson, James Frame, Marion K. Gilmour, Benjamin Guyer, J. A. V. Hamilton, J. M. Hamilton, A. R. Harbinson, James Hemphill, Ruth L. Henderson, A. T. Hendry, M. J. Hood, Jack Isaacs, Julius Jacobs, Eileen I. Jamieson, J. S. Jeffrey, George Johnston, D. M. Kissen, N. M. Lamont, W. H. Lang, W. R. C. Lang, Innes Lumsden, Mary C. Lynas, Robert McAndrew, W. F. McClemont, A. F. McCoubrey, W. M. MacDermid, Archibald MacDonald, Joseph McGlone, Robert McIlwraith, Mary M. McKelvie, Allan MacKinnon, H. A. Maclachlan, A. G. MacLeod, D. J. MacLeod, J. A. Macleod, N. F. Macleod, J. C. Meek, I. G. Meiklejohn, Edward Millar, Kathleen M. Miller, W. L. Milligan, R. D. Muckart, John Murphy, John Newton, G. W. Park, W. A. Parker, J. B. Pettigrew, R. E. Potts, A. R. Rennie, T. R. A. Richmond, David Robertson, Nathan Sher, D. W. Short, A. M. Smeaton, A. B. C. Smith, J. F. Smith, F. M. Steel, Janet I. Stewart, Sylvia J. Strachan, Thomas Symington, A. C. Tait, G. R. Thomson, J. M. Urquhart, A. R. G. Watson, J. C. Wood, F. W. C. Yardumian, W. H. Yellowlees, Maida B. Young, M. J. Young and Violet B. Young.

Scottish Conjoint Board

At recent examinations of the board of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow the following were successful :—

L.R.C.P. & S.E., L.R.F.P. & S.

C. E. V. P. Amerasinghe, Benjamin Beck, G. C. Cope, T. V. Darke, Thomas Dean, A. M. A. El Far, Yousif Farsony, Ralph Friedman, A. R. Gemmell, M. F. El Giziri, D. F. P. Gordon, David Granet, Benjamin Greenberg, J. H. Haldane, Margaret M. Hanretty, Norman Hornstein, Dorothy L. D. Johnston, George Johnstone, H. E. Klein, R. I. Kynaston, Henrietta Lennon, J. K. Lotinga, B. H. Lunine, Herbert Macpherson, O. P. Markandya, H. J. F. Mitchell, E. K. Neidich, Jack O'Hara, Valaydon Poonoosamy, E. H. Reinsberg, C. B. Robinson, Julius Schneiderman, Robert Smith, Theodore Tuller.

The following graduates of recognised foreign universities have also been admitted licentiates :—

Szulin Riterband, M.D. Rome, Else Wolfsohn, M.D. Berlin.

Tuberculosis Association

A meeting of this society will be held at 26, Portland Place, London, W.1, on Saturday, Nov. 8, at 10.30 A.M. During the morning six short papers will be read and in the afternoon there will be a discussion of problem cases and interesting radiograms.

Medical Honour

Dr. Donald Dunn, house-officer at the London Chest Hospital, has been awarded the M.B.E. Dr. Dunn carried patients to safety single-handed when the hospital was bombed.

Royal Society of Medicine

A general meeting of the fellows of this society will be held at 1, Wimpole Street on Tuesday, Nov. 4 at 3.30 P.M. On Nov. 5, at 2.30 P.M. the section of surgery will meet to discuss streptococcal cross-infection in wards. The openers will be Prof. A. A. Miles, Prof. J. Paterson Ross, Dr. M. van den Ende, and Colonel Leonard Colebrook. At 3 P.M. on the same day Prof. A. T. Jurasz will read a paper to the section of history of medicine on the foundation of the Polish medical faculty within the University of Edinburgh. On Nov. 7, at 10.30 A.M., Mr. F. Watkyn-Thomas will deliver his presidential address to the section of otology. He will speak on otitic meningitis. Mr. E. D. D. Davis has chosen as the subject of his presidential address to the section of laryngology the problems of the otolaryngologist in war. He will give it on the same day at 2.15 P.M.; at 2.30 P.M. Dr. A. D. Marston as president of the section of anæsthetics will speak on the centenary of ether as an anæsthetic.

Medical Casualties

Captain E. J. F. Hinde, M.R.C.S., R.A.M.C., has been reported missing at sea during September.

In recent casualty lists the following R.A.M.C. officers were posted as prisoners of war: T/Major J. M. Fosbrooke, F.R.C.S.E., W.S/Captain J. E. S. Carmichael, M.B. Edin., W.S/Captain A. Mikellides, and Lieutenant R. M. Solomon, M.R.C.S.

Cancer Research Studentship

The council of the Royal College of Surgeons will shortly nominate a Prophit student in cancer research. The studentship will not exceed an annual value of £500 with an allowance of £200 for travelling expenses and the appointment in the first instance will be for one year. Applications should reach the secretary of the college, Lincoln's Inn Fields, W.C.2 before Nov. 22.

CORRIGENDUM.—The reference to Gurd, F. B. and McKim, L. H. on page 429 of Oct. 11 should read: *Amer. J. Surg.* 1941, **51**, 584.

Appointments

BAILEY, J. SHACKLETON, M.R.C.S.: examining factory surgeon for Eye, Suffolk.
BRAND, W. G., M.B. Edin.: examining factory surgeon for Adlington, Lancs.
BUTTERWORTH, JOAN, M.B. Lond., D.P.H.: asst. M.O. for Hants.
GRIFFITHS, H. J., M.R.C.S., D.P.H.: temp. asst. M.O.H. for Newport, Mon.
HALBERSTAEDTER, MAX, M.B. Lond., D.M.R.E.: senior asst. radiologist to St. Mary's Hospital, Paddington.
HALLIWELL, E. O., M.R.C.P.: temp. physician to the Hull Royal Infirmary.
HUNT, A. H., D.M. Oxfd, F.R.C.S.: surgical registrar at the Royal Cancer Hospital (Free), London.
KATZ, JAKOB, M.D. Bratislava, D.P.H. Prague: temp. deputy M.O.H. for Accrington.
KLABER, ROBERT, M.B. Lond., F.R.C.P.: consulting dermatologist to the Luton and Dunstable Hospital.
KNOX, EILEEN, M.B. Brist.: asst. M.O.H. for Huddersfield.
LANCHESTER, H. C., M.A. Camb., M.R.C.S.: R.S.O. at Portwey Hospital, Weymouth.
NEWMAN, J. L., M.D. Camb., M.R.C.P., D.P.H.: deputy M.O.H. and deputy school M.O. for Warwickshire.
O'REILLY, E. J., M.B. N.U.I.: temp. asst. M.O.H. for St. Helens.
* RICHARDS, B. T., M.R.C.S., L.D.S., D.P.M.: medical superintendent of the Langho Colony for Epileptics.
ROGERS, KATHARINE, M.R.C.S., M.R.C.O.G.: M.O. (maternity and child welfare) for York.
WYBURN-MASON, R., M.B. Camb., M.R.C.P.: medical registrar at the Royal Cancer Hospital (Free), London.
* Subject to confirmation.

Births, Marriages and Deaths

BIRTHS

DESMOND.—On Oct. 9, in Bermuda, the wife of Surgeon Lieutenant A. M. Desmond, F.R.C.S., R.N.V.R.—a daughter.
DUNKERLEY.—On Oct. 20, at Westerham, Kent, the wife of Dr. Arthur Dunkerley—a daughter.
MATHESON.—On Oct. 20, in London, the wife of Mr. Iain Matheson, F.R.C.S.—a son.
MONRO.—On Oct. 19, in Singapore, the wife of Prof. J. K. Monro, M.Ch.—a daughter.
OLDFIELD.—On Oct. 21, at Harewood, Leeds, the wife of Major Michael Oldfield, F.R.C.S., R.A.M.C.—a daughter.
RICHARDS.—On Oct. 18, the wife of Dr. A. M. Richards, of Banbury Road, Oxford—a daughter.

MARRIAGES

FLETCHER—SEELY.—On Oct. 24, at Winchester, Charles Montague, M.R.C.P., only son of the late Sir Walter Morley Fletcher, to Louisa Seely.
FRASER—BEETHAM.—On Oct. 16, at Bermuda, Peter Kennedy Fraser, M.D., Surgeon Lieut.-Commander, R.N., to Doris Beetham.
HARPER—SPILLER.—On Oct. 18, Curzon Harper, of Barking, to Violet Spiller, M.D., of Streatham.
HART—MEYER.—On Oct. 25, in London, Philip D'Arcy Hart, M.D., to Ruth Meyer.
HEWITT—WOOD.—On Oct. 25, at Watford, Edward John Campbell Hewitt, M.D., R.A.M.C., of Shenley, to Joan Millicent Wood.

DEATHS

ANDREW.—On Oct. 23, at St. Austell, Wilfrid Andrew, L.M.S.S.A.
BENOLY.—On Oct. 22, at New Clipstone, Notts, Nathaniel Benoly, M.D. Würzburg, L.R.C.P., formerly of Bethnal Green Road, London, aged 92.
BRIDGES.—On Oct. 22, in Cheltenham, Arthur Brodie Hamilton Bridges, O.B.E., M.R.C.S., major, R.A.M.C., late of Kilmington, Devon.
REDFERN.—On Oct. 23, at Compton, Winchester, John Joseph Redfern, M.D. Belf., aged 80.
WARD.—On Oct. 23, at Bournemouth, John Alfred Ward, M.D. Durh., aged 77.

Notes, Comments and Abstracts

HABITUALLY AND FOR GAIN

L. FARRER BROWN, B.SC. (ECON.) LOND.
BARRISTER-AT-LAW

THE innocent looking phrase "habitually and for gain" has made its reappearance in connexion with a proposal that unqualified persons should be prohibited from making nursing their livelihood. The midwifery profession had experience of the phrase from 1910 to 1926. Accounts of that experience appeared at the time in annual reports of the Central Midwives Board and of medical officers of health, but a brief recital may be of interest.

The Midwives Act 1902 (section 1 (2)) provided that from April 1, 1910 (which was about 7 years after the Roll of Midwives had been established), no woman should "habitually and for gain attend women in childbirth otherwise than under the direction of a qualified medical practitioner" unless she was certified as a midwife. Exemption was granted to legally qualified medical practitioners and to "anyone rendering assistance in a case of emergency." Any woman who offended against this provision was liable on conviction before a court of summary jurisdiction to a fine not exceeding £10.

A considerable number of prosecutions were undertaken in different parts of the country and fines of varying amounts were imposed on offenders; but in many cases in which there appeared to be a clear breach of the law the matter was not brought into court or the prosecution was unsuccessful because of the loopholes open to a defendant. For a prosecution to be successful five things had to be proved:

(1) that the defendant was not a certified midwife;
(2) that she had attended habitually;
(3) that she had attended for gain;
(4) that she attended otherwise than under the direction of a doctor; and
(5) that her attendance was not the rendering of assistance in a case of emergency.

Proof of the first was easy, but the remaining four often presented difficulties. Many magistrates required strict proof that attendance had been habitual and for gain. "Habitually" is an elastic term and was a hard thing to prove because evidence was required of attendance under improper conditions in a number of cases and within a recent period. "For gain" is ambiguous. If payment is not demanded but a present is given as a thank-offering is that gain? Even when the payment of money could be proved, evidence that the defendant had rendered other services at the same time, such as washing clothes, cooking, helping in the house, or looking after the other children in the family, tended to weaken the prosecution's case. To prove the payment of money was not without its difficulties. For example, the mother states on oath that she called at the defendant's house and paid the defendant's fee for attending at the confinement, but was not given a receipt. The defendant denies having received any payment and declares that she attended the mother merely as a friend. There is a conflict of statements and in the absence of a witness or a receipt signed by the defendant the charge is likely to be dismissed on the ground that there is no evidence corroborating the mother's statement.

"Covering" by medical practitioners provided some offenders with the means of escaping punishment. At one stage such covering was by no means infrequent, and the Central Midwives Board therefore brought proceedings against certain doctors before the General Medical Council. The first of these cases was in respect of covering in its most open and common form. The doctor had arranged with an uncertified woman to "look after" her cases for her "at the modified fee of 7*s.* 6*d.*" It was proved that three women had been delivered by the uncertified woman, that the doctor had called the next day but not subsequently, that he had not examined the patients, and that he had been paid a fee of 7*s.* 6*d.* by the uncertified woman in each case. He had notified the births—a proceeding clearly designed to conceal that the women had been delivered by the uncertified woman alone. The doctor was found guilty by the General Medical Council.

The exemption granted to anyone rendering assistance in an emergency was abused. This abuse seems to have been facilitated by the attitude of some benches of magistrates and by the desire of many patients to screen the uncertified women who had attended them. In one case in the home counties the defendant pleaded guilty, but said that she wished to continue her work as a midwife in the interests of the poor of the neighbourhood. Apparently the sympathies of the women she had attended in their confinements, of the magistrates and of the general public present at the hearing were enlisted on her behalf. The chairman of the bench stated that they were bound to record a conviction but did so with very great regret, that they would reduce all the defendant's expenses and would only impose a fine of 1*s.* which would be paid by one of the members of the bench. The chairman then informed the defendant that in future she could act in the absence of a doctor only when the case was one of emergency, to which she replied "There will be plenty of emergency cases then," and the chairman responded "We know you are doing a good work."

A change in the law was made in 1926. The phrase "habitually and for gain" was dropped, and an attempt was made to prevent abuse of the necessary exemption in a case of emergency by placing on the defendant the onus of proving that attention had been given "in a case of sudden or urgent necessity." The new provision,[1] which is still in force, was in the following terms:

"If any person, being either a male person or a woman not certified under this act, attends a woman in childbirth otherwise than under the direction and personal supervision of a duly qualified medical practitioner, that person shall, unless he or she satisfies the court that the attention was given in a case of sudden or urgent necessity, be liable on summary conviction to a fine not exceeding ten pounds."

Exemption was granted to pupil-midwives and medical students attending confinements as part of their training. It will be noted that a curious omission in the earlier act was remedied. In the 1902 Act the prohibition applied only to unqualified *women*. In 1926 unqualified men-midwives were brought within the scope of the prohibition.

BRITISH COLLOIDS LTD. (Crookes Laboratories) have withdrawn the following lotions and creams from the general market: Lacto-calamine, calamine cream and lotion, zinc cream, and mercury and sulphur scalp lotion. These preparations will in future only be supplied on a doctor's prescription.

Infectious Disease in England and Wales

WEEK ENDED OCT. 18

Notifications.—The following cases of infectious disease were notified during the week: smallpox 0; scarlet fever, 1195; whooping-cough, 1979; diphtheria, 1002; paratyphoid, 62; typhoid, 16; measles (excluding rubella), 783; pneumonia (primary or influenzal), 624; puerperal pyrexia, 161; cerebrospinal fever, 107; poliomyelitis, 50; polio-encephalitis, 2; encephalitis lethargica, 4; dysentery, 143; ophthalmia neonatorum, 86. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Oct. 15 was 1295; including scarlet fever, 168; diphtheria, 267; measles, 19; whooping-cough, 530; enteritis, 24; chicken-pox, 17; erysipelas, 25; mumps, 9; poliomyelitis, 6; dysentery, 17; cerebrospinal fever, 14; puerperal sepsis, 14; enteric fevers, 46; german measles, 2; other diseases (non-infectious) 56; not yet diagnosed, 81.

Deaths.—In 126 great towns there was 1 (1) death from enteric fevers, 2 (0) from scarlet fever, 1 (0) from measles, 10 (4) from whooping-cough, 11 (1) from diphtheria, 46 (0) from diarrhœa and enteritis under 2 years, and 12 (0) from influenza. The figures in parentheses are those for London itself.

Sheffield reported 8 deaths from diarrhœa, Birmingham 7, and Manchester 6. In the same week Dublin had 22 fatal cases of diarrhœa and Glasgow 15.

The number of stillbirths notified during the week was 180 (corresponding to a rate of 33 per thousand total births), including 18 in London.

1. Midwives Act 1926, section 1.

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4,000 *units or more per c.c.*

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SPECIFIC AGAINST the micro-organisms causing abscesses, boils, eczema, dermatitis, erysipelas, hæmorrhoids, impetigo, ulcers and all inflammatory cutaneous affections. **ANTIPEOL LIQUID** for infections of the ear, septic cavities and suppurating wounds

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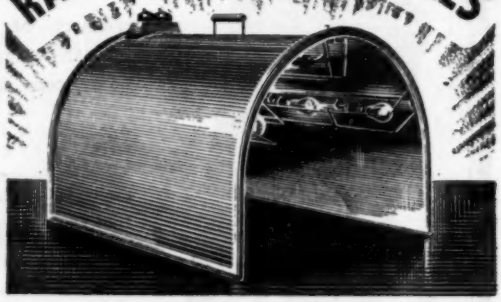

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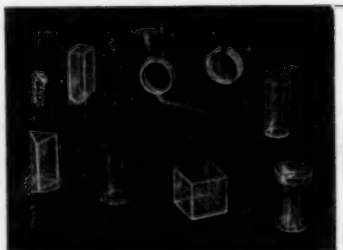

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10th to 14th November, 1941

Monday, 10th Nov.	10 A.M.	The Surgical Anatomy of the Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	10.30 A.M.	(*a*) Mechanism and Nature of the Injuries of the Skull.	Mr. G. C. Knight, F.R.C.S.
		(*b*) Mechanism and Nature of the Concomitant Injury to the Brain.	Mr. G. C. Knight, F.R.C.S.
	2 P.M.	Pathology of Wounds of the Nervous System.	Mr. G. C. Knight, F.R.C.S.
Tuesday, 11th Nov.	10 A.M.	(*a*) Closed Injuries of Skull and Brain, Their Complications and Management.	Mr. D. W. C. Northfield, M.S., F.R.C.S.
		(*b*) Immediate Treatment and Management of Wounds of Skull and Brain.	Mr. D. W. C. Northfield, M.S., F.R.C.S.
	2 P.M.	Demonstrations on the Cadaver of Operations on Skull and Brain.	Mr. A. K. Henry, F.R.C.S.
Wednesday, 12th Nov.	10 A.M.	Surgical Sequelæ of Wounds of Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	12.15 P.M.	Use of X-rays in the Diagnosis of Head Injuries.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	Disorders following Head Injuries.	Dr. J. Purdon Martin, M.D., F.R.C.P.
	3.15 P.M.	Hysterical Disorders Associated with War Wounds.	Dr. Aubrey Lewis, M.D., F.R.C.P.
Thursday, 13th Nov.	10 A.M.	Some Sequelæ of War Wounds of Skull and Brain.	Mr. Harvey Jackson, F.R.C.S.
	12 NOON	Demonstration on the Cadaver of Operations on the Spine.	Mr. A. K. Henry, F.R.C.S.
	2 P.M.	War Injuries of the Spinal Cord.	Prof. Lambert Rogers, F.R.C.S., F.A.C.S., F.R.A.C.S.
Friday, 14th Nov.	10 A.M.	Peripheral Nerve Injuries: (1) Diagnosis.	Prof. H. J. Seddon, D.M., F.R.C.S.
	11.30 A.M.	Peripheral Nerve Injuries: (2) Treatment.	Prof. H. J. Seddon, D.M., F.R.C.S.
	2.15 P.M.	Possibilities of Nerve Grafting.	Mr. F. H. Bentley, F.R.C.S.
	3.15 P.M.	Care of Bladder in Injuries of the Nervous System.	Sir Alfred Webb-Johnson, C.B.E., D.S.O., F.R.C.S.

The fee for the Course is one guinea. Officers of the Armed Forces wishing to attend these lectures without payment of the fee should apply through their respective Director-Generals. Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12.

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11TH NOVEMBER, 1941: Introductory Lecture—"The Royal Faculty, and its Contributions to Medicine." By Mr. Roy F. Young, M.C.
25TH NOVEMBER, 1941: "Some War-time Problems of a Cardiologist." By Prof. J. Crighton Bramwell.
9TH DECEMBER, 1941: "Injuries of the Face in War-time." By Mr. Archibald H. McIndoe.
13TH JANUARY, 1942: "Hæmorrhagic States." By Prof. L. J. Witts.
27TH JANUARY, 1942: "Bronchiectasis." By Mr. J. E. H. Roberts, O.B.E.
10TH FEBRUARY, 1942: "Prematurity." By Prof. Charles McNeil.
24TH FEBRUARY, 1942: "The Management of Closed Head Injuries." By Prof. Geoffrey Jefferson.
10TH MARCH, 1942: "The Abdominal Injuries of Total Warfare." By Surg. Rear-Admiral Gordon Gordon-Taylor, O.B.E.

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(Incorporated under Royal Charter),
Fulham-road, London, S.W.3.

Applications are invited for the Two posts of HOUSE SURGEONS (A), including R practitioners within three months of qualification, when appointments will be for a period of six months, to commence duty on the 1st January, 1942. Salary at the rate of £200 per annum each. The appointment is subject to rules, a copy of which can be obtained from the Secretary.

Applications, to be made on a form which will be supplied by the Secretary, with copies only of not more than three recent testimonials, to be sent to the Secretary not later than the first post on Wednesday, 12th November, 1941.

CLEMENT COBBOLD, Secretary.

Royal Eye Hospital,

St. George's-circus, S.E.1.

HOUSE SURGEON (B2).

Applications are invited from registered medical practitioners for the appointment of House Surgeon (B2) to become vacant on 17th November, 1941, including R practitioners holding A posts. The appointment will be for a period of six months in the first instance. Salary is at the rate of £100 per annum, with full emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, should be sent to the undersigned not later than 3rd November, 1941.

F. E. D'ALTON, Secretary.

London Chest Hospital,

Victoria Park, E.2.

Vacancy for Class B2 HOUSE PHYSICIAN will occur on 1st January, 1942. R practitioners now holding A posts may apply. Six months' appointment. Salary at the rate of £150 per annum, board, residence, and laundry provided.

Applications, with copies of three testimonials, should be sent before 20th November to the SECRETARY.

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Applications are invited from registered medical practitioners for the whole-time appointment of MEDICAL REGISTRAR (B1). Applicants must not be more than ten years qualified. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £200 per annum if the successful candidate does not hold an M.S. agreement and in which case the Hospital pays no remuneration.

Applications, stating age, and accompanied by copies of three recent testimonials, should be sent to the undersigned (from whom all information may be obtained) on or before the 6th December.

RICHARD T. BARTLEY, Secretary.

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Applications are invited from registered medical practitioners for the whole-time appointment of OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR (B1). Applicants must not be more than ten years qualified. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £350 per annum.

Applications, stating age, and accompanied by copies of three recent testimonials, should be sent to the undersigned (from whom all information may be obtained) on or before the 6th December.

RICHARD T. BARTLEY, Secretary.

Battersea General Hospital,

London, S.W.11.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners, Male or Female, for the above appointment, including R practitioners within three months of qualification. The appointment is for six months. The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, nationality, and qualifications, and accompanied by copies of two recent testimonials, should be sent to the SECRETARY of the Hospital immediately.

Middlesex County Council.

RESIDENT ASSISTANT MEDICAL OFFICER (B1) required for COUNTY SANATORIUM AND HOSPITAL, Clare Hall, South Mimms, Middlesex. Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had experience in diagnosis and treatment of tuberculosis. Post now vacant. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time duties, such as Council may direct, under supervision of Medical Superintendent. Appointment is for four years only, subject to medical examination and one month's notice.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, to the undermentioned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 15th November, 1941. C. W. RADCLIFFE, "B3," Clerk of the County Council.

Guildhall, Westminster, S.W.1.

Dreadnought Seamen's Hospital,

GREENWICH.

Applications are invited from British Male registered medical practitioners for the appointment of HOUSE PHYSICIAN (B1), to become vacant on 1st November. Suitably qualified R practitioners holding B2 or B1 posts may apply. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and accompanied by copies of three recent testimonials, should be sent immediately to the undersigned. F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, Greenwich, S.E.10.

London Jewish Hospital,

Stepney Green, E.1.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1), which is now vacant. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding Diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £350 or £550 per annum according to qualifications.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent immediately to the Secretary.

Memorial Hospital,

Shooters-hill, London, S.E.18.
(General Hospital—112 Beds.)

Applications are invited from registered medical practitioners including R practitioners who now hold A posts, for the appointment of JUNIOR RESIDENT MEDICAL OFFICER (House Surgeon—B2 post) to become vacant on December 1st, 1941. The appointment will be for six months. Salary at the rate of £200 per annum with full residential emoluments.

Applications must be made on the prescribed form obtainable from the undersigned, and sent in with copies of three recent testimonials, not later than 17th November, 1941.

R. S. G. HUTCHINGS, Secretary.

National Dental Hospital

(DENTAL DEPARTMENT OF UNIVERSITY COLLEGE HOSPITAL).

Applications are invited for the appointment of HONORARY ASSISTANT ANÆSTHETIST for duty on one morning per week. The possession of a Diploma in Anæsthetics will be considered an advantage. The successful candidate will be appointed for one year in the first instance and thereafter will be eligible for reappointment annually, and ultimately for promotion to the rank of full Anæsthetist.

Applications, supported by not more than three testimonials, should be forwarded to the SECRETARY, University College Hospital, Gower-street, W.C.1, by NOON on Friday, 14th November, 1941.

Parkside Hospital, Macclesfield.

Applications are invited from registered Male medical practitioners, for the appointment of a HOUSE DOCTOR (A), including R practitioners within three months of qualification, when appointment will be for a period of six months. Otherwise it will be for a period of twelve months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL SUPERINTENDENT.

York County Hospital.

(222 Beds.)

Applications are invited from registered medical practitioners for the appointment of a HOUSE PHYSICIAN (B2), vacant immediately, including R practitioners holding A posts when appointment will be limited to six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

J. R. MACKRILL, Secretary.

Queen Victoria Hospital,

MORECAMBE AND HEYSHAM.

Applications are invited for the post of RESIDENT HOUSE SURGEON (Female). Salary £150 per annum. The Hospital has 72 Beds, with maternity, massage and electrical treatment, X-ray, pathological, and out-patients' department.

Applications, stating age, nationality, qualifications with dates, and experience, accompanied by copies of testimonials and photograph, should be sent to the undersigned, endorsed "House Surgeon," not later than 15th November, 1941.

THOS. P. TIPLADY, Secretary.

Royal Hospital, Richmond, Surrey.

Applications are invited from registered medical practitioners (Male, British subjects) for the appointment of a HOUSE SURGEON (A) to become vacant on the 1st November, 1941, including R practitioners within three months of qualification, when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to the SECRETARY-SUPERINTENDENT.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

West Sussex County Council.

ST. RICHARD'S HOSPITAL, CHICHESTER.
(Accommodation 144 Beds, expanded to 678 Beds.)

APPOINTMENT OF SENIOR ASSISTANT MEDICAL OFFICER (B1).

Applications are invited from registered medical practitioners (Male) for the appointment of Senior Assistant Medical Officer (B1) at this Hospital, to become vacant on 1st January, 1942, at a salary of £350 per annum, rising by annual increments of £25 to a maximum of £450 per annum, together with full residential emoluments. If preferred, a small house is available, rent and rates free, with an additional allowance of £50 per annum, in lieu of residential emoluments. The appointment is a temporary one (replacement of permanent Medical Officer called up for military service) and is subject to one month's notice on either side. Candidates should have held house appointments and have had surgical experience. The successful candidate will be expected to act as Deputy Medical Superintendent and will thus gain valuable experience in hospital administration, though previous experience in this branch will be an additional qualification for the post. R practitioners holding B2 or B1 appointments are invited to apply.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments (with dates), and accompanied by copies of not more than three recent testimonials, should be sent to the undersigned not later than 17th November, 1941.

T. C. HAYWARD, Clerk of the County Council.

County Hall, Chichester, October, 1941.

Stockport Infirmary.

(159 Beds—5 Residents.)

Applications are invited from unmarried registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A) (General Surgical and Gynæcological), to become vacant on 6th December, including R practitioners within three months of qualification when appointment will be for a period of six months. Post approved under the F.R.C.S. regulations. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than first post 5th November. H. G. PRICE, Secretary-Superintendent.

Hull Corporation Health Department.

TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH (MALE OR FEMALE).

Applications are invited from duly qualified medical Men or Women under forty years of age, and of not less than three years' standing in their profession, for the above temporary post. Preference given to candidates possessing the Diploma in Public Health or equivalent qualification, and to those experienced in refraction work. Salary £600 per annum, rising by annual increments of £25 to £700 per annum. Duties consist mainly of work in the School Medical Department.

Application forms may be obtained from, and should be returned to, the MEDICAL OFFICER OF HEALTH, Guildhall, Hull, not later than 10 A.M. on Monday, 17th November, 1941.

Doncaster Royal Infirmary.

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for a CASUALTY HOUSE SURGEON (Male) (A), required immediately.

The appointment is for six months. Salary at the rate of £175 per annum, with residence, board, and laundry.

This large industrial area offers excellent opportunity for gaining experience.

Applications, accompanied by not more than three testimonials, to be sent to the undersigned immediately.

R. LANCASTER, Secretary-Superintendent.

County Borough of Huddersfield.

ASSISTANT SCHOOL MEDICAL OFFICER.

Applications are invited for the above post. Good knowledge of diseases of children and experience in bacteriology essential. Salary according to scale—£500 per annum, increasing by £25 per annum to £700. Previous experience taken into account. The post is a temporary one, subject to one month's notice.

Applications, stating age, full particulars of training, qualifications, and experience, and enclosing copies of two recent testimonials, should be forwarded to the CHIEF SCHOOL MEDICAL OFFICER, Ramsden-street, Huddersfield, not later than Thursday, 6th November, 1941.

City of Cardiff Public Health DEPARTMENT.

MUNICIPAL ACCIDENT UNIT.
(Situated at City Lodge Hospital.)

RESIDENT SURGICAL OFFICER (B1).

Applications are invited for the appointment of Resident Surgical Officer at the City of Cardiff Municipal Accident Unit. The officer appointed will be responsible for the treatment of all accident cases admitted to the Unit. He will work under the clinical direction of a Visiting Consultant Surgeon and under the administrative direction of the Medical Officer of City Lodge Hospital, who is also the Medical Superintendent of Llandough (Cardiff Municipal) Hospital where long-stay cases are treated. Preference will be given to candidates holding a qualification of F.R.C.S., or the Primary F.R.C.S. (Eng.). Experience in treatment of fractures is essential and general orthopædic experience desirable. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The salary will be £350 per annum, rising by annual increments of £25 to £450 per annum, with full residential emoluments and a travelling allowance of £10 per annum. All witness and other fees received will be returnable to the Council.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of three recent testimonials, endorsed "Resident Surgical Officer," must be sent to the Medical Officer of Health, City Hall, Cardiff, so as to reach him not later than 12th November, 1941.

D. KENVYN REES, Town Clerk.

City Hall, Cardiff, 28th October, 1941.

Newark General Hospital.

(66 Normal Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of RESIDENT HOUSE SURGEON (B2), vacant on or about 9th December. R practitioners holding A posts may apply when appointment will be limited to six months. Salary at the rate of £200 per annum, with full residential emoluments.

Also for appointment of JUNIOR HOUSE SURGEON (A), for which R practitioners within three months of qualification may apply. Vacant on or about 9th December. The appointment is for six months. Salary at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, sex, nationality, qualifications with dates, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

B. C. DION, Secretary-Superintendent.

County Borough of Southampton.

APPOINTMENT OF DEPUTY MEDICAL OFFICER OF HEALTH.

Applications are invited for the above appointment at a salary of £720 per annum, together with a car allowance of £30 per annum.

Form of application, giving full particulars, may be obtained from the undersigned, and must be returned to him as early as possible.

H. C. MAURICE WILLIAMS, Medical Officer of Health.

Civic Centre, Southampton, 27th October, 1941.

City and County of Newcastle upon TYNE.

SHOTLEY BRIDGE HOSPITAL. (900 Beds.)

APPOINTMENT OF HOUSE PHYSICIANS (A) AND HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners for the above appointments, including R practitioners within three months of qualification. The appointments will be tenable for a period of six months. Salary £150 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

Owing to the fact that the permitted establishment of refugee practitioners at the Hospital is already complete, it is regretted that applications for above appointments from refugee practitioners cannot be considered.

City and County of Newcastle upon TYNE.

CITY HOSPITAL FOR INFECTIOUS DISEASES.

APPOINTMENT OF JUNIOR RESIDENT MEDICAL ASSISTANT (A).

Applications are invited from registered medical practitioners, Male and Female, for the appointment of Junior Resident Medical Assistant (A), to become vacant on 3rd November, 1941, including R practitioners within three months of qualification. The appointment is tenable for a period of six months. Salary at the rate of £250 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, to be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

Owing to the fact that the permitted establishment of refugee practitioners at the above Hospital is already complete, it is regretted that applications from refugee practitioners cannot be considered.

City and County of Newcastle upon TYNE.

MATERNITY HOSPITAL, GILSLAND. (120 Beds.)

APPOINTMENT OF HOUSE SURGEON (B2).

Applications are invited from registered medical practitioners, Male or Female, including R practitioners holding A posts for the appointment of House Surgeon (B2), now vacant. Applicants must have had at least six months' obstetric experience in a maternity hospital. The appointment is limited to six months, and the salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1, immediately, stating earliest date on which the appointment could be taken up.

County Borough of Middlesbrough.

ASSISTANT MEDICAL OFFICER OF HEALTH, MATERNITY AND CHILD WELFARE.

The Middlesbrough Corporation invite applications from registered medical practitioners (Women) for the appointment of Assistant Medical Officer of Health, Maternity and Child Welfare.

Applicants must have had experience in antenatal work, midwifery, and diseases of children, with not less than three years' post-graduate experience.

Commencing salary will be at the rate of £350 per annum, with residence, board, and laundry, valued at £150, making £500 in all and rising, subject to satisfactory service, by annual increments of £25 to a maximum of £700. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and to the regulations governing conditions of service made by the Middlesbrough Corporation. The successful candidate will be required to pass a medical examination.

The successful candidate will be required to reside at the Municipal Maternity Hospital, and to devote the whole of her time to the duties of the office, and to act under the direction of the Medical Officer of Health.

Applications, stating age and experience, together with copies of three recent testimonials, to be sent to the Medical Officer of Health, Municipal Buildings, Middlesbrough, immediately. PRESTON KITCHEN, Town Clerk.

Municipal Buildings, Middlesbrough, 16th October, 1941.

Manchester and Salford Hospital for SKIN DISEASES.

(54 Beds—17,500 Out-patients per annum.)

HOUSE SURGEON (A).

Applications are invited, including R practitioners within three months of qualification, for the post of House Surgeon (A). Must be registered. The appointment is for six months. Salary at the rate of £150 per annum, with board and residence.

Applications, with copies of three testimonials, to be sent to the undersigned, Quay-street, Manchester, as soon as possible. JOHN NALL, Secretary.

County Borough of Northampton.

APPOINTMENT OF TEMPORARY ASSISTANT MEDICAL OFFICER FOR MATERNITY AND CHILD WELFARE WORK.

The Town Council of Northampton invites applications from registered medical Women between the ages of twenty-five and forty-five years for the above whole-time appointment.

Applicants should have had at least three years' experience in the practice of their profession and have had special experience in midwifery and antenatal work and administrative duties in connexion with maternity and child welfare. They should also be registered in the Medical Register as holders of a diploma in sanitary science, public health, or State medicine.

The officer appointed will be required to devote her whole time to the duties of the office. These comprise such administrative and clinical work, under the direction and supervision of the Medical Officer of Health, as may reasonably appertain to the Council's scheme of maternity and child welfare.

The salary is £600 per annum, plus a temporary cost-of-living bonus at present amounting to £24 per annum. The post is subject to the Local Government Superannuation Acts and the selected candidate will be required to pass satisfactorily a medical examination.

Copies of application forms and list of duties may be obtained from the Medical Officer of Health, 7A, St. Giles'-square, Northampton. Applications, accompanied by copies of not more than three recent testimonials, must reach the undersigned not later than Wednesday, 12th November, 1941.

W. R. KEW, Town Clerk.

Guildhall, Northampton, 20th October, 1941.

Hull Corporation Health Department.

BEVERLEY ROAD INSTITUTION AND HOSPITAL.

TEMPORARY MEDICAL OFFICER.

Applications are invited from Male registered medical practitioners for the appointment of Medical Officer at the Beverley Road Institution and Hospital. The appointment will be a temporary one for the duration of the war, and candidates should be ineligible for military service. Administrative experience in a public assistance or general hospital essential. Salary will be at the rate of £800 per annum, together with unfurnished house.

Full particulars and forms of application may be obtained from the MEDICAL OFFICER OF HEALTH, Guildhall, Hull, and completed applications should be returned to him not later than 10 A.M. on Monday, the 10th November, 1941.

City of Leicester.

ISOLATION HOSPITAL.

RESIDENT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners for the appointment of a Resident Medical Officer at the above Hospital. R practitioners who now hold A posts may apply when the appointment will be limited to six months, otherwise it will be renewable for a further six months. Salary at the rate of £300 per annum, with the usual residential emoluments. The officer appointed may be required to assist with infant welfare work.

Applications, on forms to be supplied, to be sent to the undersigned immediately.

E. K. MACDONALD, Medical Officer of Health.

Health Offices, Grey Friars, Leicester, October, 1941.

Coventry and Warwickshire Hospital.

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B1).

Applications are invited from registered medical practitioners for the appointment of Resident Surgical Officer. Applicants must have held house appointments and had surgical experience. Preference will be given to candidates holding the diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £350 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of not more than three recent testimonials, should be addressed to the HOUSE GOVERNOR, Coventry and Warwickshire Hospital, Coventry.

Royal Infirmary, Bradford.

Applications are invited from registered medical practitioners (Male) for the post of HOUSE PHYSICIAN (B2), including R practitioners who now hold A posts. Six months' appointment. Salary £150 per annum, with board, residence, and laundry. There are 345 Beds and 10 Resident Officers.

Applications, stating age, nationality, qualifications, and previous experience, with copies of three recent testimonials, should be sent to the undersigned immediately.

H. TRUSSON, House Governor and Secretary.

13th October, 1941.

Applications are invited for the post of OUT-PATIENTS' MEDICAL OFFICER.

Successful candidates will be required to undertake morning work in the Out-patient Department. Applicants must be registered medical practitioners and possess a good knowledge of refraction work. Salary £200 per annum, six mornings per week.

Applications, giving qualifications and age, accompanied by three recent testimonials, should be sent to the GENERAL SUPERINTENDENT AND SECRETARY, MANCHESTER ROYAL EYE HOSPITAL.

Surrey County Council.

TEMPORARY ASSISTANT MEDICAL OFFICER required for duty at BROOKWOOD MENTAL HOSPITAL, near Woking, Surrey. Salary £350 per annum, plus emoluments valued at £150, of which £50 is paid in cash in lieu of board. Meals can be obtained in the Hospital cafeteria at moderate charges. Appointment subject to termination by one month's notice on either side.

Applications to be sent to the Medical Superintendent, Brookwood Hospital, Knaphill, near Woking, Surrey, not later than Wednesday, 12th November, 1941.

DUDLEY AUKLAND, Clerk of the Council.

28th October, 1941.

Surrey County Council.

TEMPORARY ASSISTANT MEDICAL OFFICERS.

Applications are invited for the appointment of Temporary Assistant Medical Officers. Applicants must possess a qualification in Public Health. The main duties will be in connexion with the School Medical and Maternity and Child Welfare Services, but the officers appointed will be required to undertake such other public health duties as may be allocated to them. They will be on the staff of the County Medical Officer of Health, must reside in the County of Surrey, and devote their whole time to the work.

Salary at the rate of £600 per annum. Travelling expenses in accordance with the Council's scale will be allowed.

The appointments will be subject to the approval of the Ministry of Health and the Board of Education, to the successful candidates passing a medical examination, to the provisions of the Local Government Superannuation Act, 1937, and to the staffing regulations of the Council, which provide, inter alia, that appointments may be determined at any time by one month's notice.

Applications, stating age, qualifications, and experience, together with copies of three recent testimonials, should be made on the prescribed form and sent to the County Medical Officer of Health, Technical College, Stoke Park, Guildford, from whom copies of the application form may be obtained, and to whom any enquiries relating to the appointment should be addressed.

Last day for receipt of applications, 8th November, 1941.

Canvassing, directly or indirectly, will disqualify.

DUDLEY AUKLAND, Clerk of the County Council.

Technical College, Stoke Park, Guildford,
14th October, 1941.

Surrey County Council.

PUBLIC HEALTH DEPARTMENT.

KINGSTON COUNTY HOSPITAL.

RESIDENT ASSISTANT MEDICAL OFFICER (B2).

Applications are invited for the above appointment, which will be available for a period of six months as from the 22nd November, 1941, renewable for a further six months. (R practitioners who hold A appointments may apply, but if appointed the term of appointment is limited to six months.)

The salary will be at the rate of £250 per annum, together with full residential emoluments valued at £125 per annum.

Applicants should preferably have had previous resident hospital experience.

Applications, stating nationality, age, qualifications and experience, and enclosing copies of not more than three recent testimonials, should be sent to the Medical Superintendent, Kingston County Hospital, Wolverton-avenue, Kingston-upon-Thames, so as to reach him not later than 7th November, 1941.

DUDLEY AUKLAND, Clerk of the Council.

County Hall, Kingston-upon-Thames, 24th October, 1941.

Borough of Swinton and Pendlebury.

PART-TIME APPOINTMENT.

The Corporation of Swinton and Pendlebury invite applications from Lady medical practitioners, preferably holding a Diploma in Public Health, to act as Part-time ASSISTANT MEDICAL OFFICER under the direction of the Council's Medical Officer of Health at a salary of £250 per annum, plus one guinea and a half for each additional session.

The appointment in the first instance will be made for one year only, and the duties of the officer appointed will be for five afternoon sessions per week and will be mainly connected with the School Medical and Child Welfare Services of the Council. Experience in midwifery and the diseases of children is required.

Applications to be made on a form to be obtained from the Medical Officer of Health, Health Offices, Town Hall, Swinton, Lancs, and to be returned, addressed to the Town Clerk and endorsed "Assistant Medical Officer," not later than 8th November, 1941.

Canvassing, directly or indirectly, is prohibited and will disqualify. VINCENT COLLINGE, Town Clerk.

Town Hall, Swinton, Lancs, 17th October, 1941.

Royal West Sussex Hospital,

CHICHESTER. (334 Beds.)

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B2).

Applications are invited from registered medical practitioners, including R practitioners holding A posts, for the appointment of Resident Surgical Officer (B2), vacant on 1st December next. The appointment is for six months. Salary £225 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality and present post, together with three recent testimonials, should be sent to the undersigned by 14th November, 1941.

K. H. WILLIAMS, House Governor and Secretary.

Staffordshire County Council.

ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH AND MEDICAL OFFICER OF HEALTH.

Applications are invited for the joint whole-time appointment of an Assistant County Medical Officer of Health for the Administrative County of Stafford, and Medical Officer of Health for the Willenhall Urban District (estimated population 28,610). The salary will be at the rate of £800 per annum, and will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applicants must be fully qualified medical men with experience in public health duties, and must hold the Diploma in Public Health. The person appointed will, as regards his duties as Assistant County Medical Officer of Health, act under the direction of the County Medical Officer of Health, and will be required to perform such duties as may be from time to time prescribed. As regards his duties as District Medical Officer of Health, the officer will be subject to the sole control and direction of the local sanitary authority.

The joint appointment is subject to the approval of the Minister of Health and the Board of Education, and also, so far as the office of District Medical Officer of Health is concerned, to the provisions of the Sanitary Officers (Outside London) Regulations, 1935.

The joint appointment will be subject to three calendar months' notice on either side, subject so far as the office of District Medical Officer of Health is concerned to the consent of the Minister of Health.

The successful candidate will be required to pass a medical examination and to produce a birth certificate.

Forms of application may be obtained from the undersigned, and should be returned by first post on the 13th November, 1941, together with copies of not more than three testimonials.

H. L. UNDERWOOD, Clerk of the County Council.

County Buildings, Stafford, 15th October, 1941.

West Sussex County Council.

CHICHESTER CITY COUNCIL AND MIDHURST RURAL DISTRICT COUNCIL.

ASSISTANT COUNTY MEDICAL OFFICER AND DISTRICT MEDICAL OFFICER OF HEALTH.

Applications are invited for the joint whole-time appointment of Assistant County Medical Officer for the Administrative County of West Sussex and Medical Officer of Health for Chichester City (population 18,500) and the Midhurst Rural District (population 18,000) at an inclusive salary of £800 per annum, rising by annual increments of £50 to £900 per annum.

Applicants, who should not be over forty-five years of age, must be registered medical practitioners, with experience in public health work, and must hold the Diploma in Public Health or its equivalent.

The joint appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the selected candidate will be required to pass a satisfactory medical examination.

Forms of application, together with further particulars as to duties and conditions of appointment, may be obtained from the undersigned T. C. Hayward, and, accompanied by copies of not more than three recent testimonials, should be returned to him not later than the 10th November, 1941.

T. C. HAYWARD,
Clerk of the West Sussex County Council.

ERIC BANKS,
Town Clerk, Chichester.

J. M. FURNEAUX,
Clerk to the Midhurst Rural District Council.

County Hall, Chichester, October, 1941.

Graylingwell Hospital, Chichester.

TEMPORARY ASSISTANT MEDICAL OFFICER (Male or Female) (B2) required immediately at the above Mental Hospital. R practitioners not eligible. Previous experience in Psychiatry desirable. Salary, if single, £400, plus war bonus, together with full board and lodging valued at £150 per annum. An additional £50 is payable for possession of the D.P.M. If married, special arrangements for living out and adjustment of salary can be made. Appointment terminable by one month's notice.

Applications, giving full particulars and copies of recent testimonials, should be sent to the MEDICAL SUPERINTENDENT

City of Stoke-on-Trent

EDUCATION COMMITTEE.

ASSISTANT SCHOOL MEDICAL OFFICER.

Applications are invited from fully qualified and registered medical practitioners for the post of Assistant School Medical Officer. Salary scale: £500 to £700 per annum by annual increments of £25, subject to satisfactory service. A car allowance is made. The successful candidate will be required to devote the whole of his (her) time to the duties of the office, and work under the immediate direction of the Senior School Medical Officer. The duties will consist of routine medical inspection and school clinic work. The appointment is subject to one month's notice on either side to terminate the engagement, and to the Local Government Superannuation Act, 1937. Canvassing will be considered a disqualification.

Forms of application may be obtained from the undersigned on receipt of a stamped addressed foolscap envelope, and completed forms should be submitted not later than the 28th November, 1941. Envelopes should be endorsed "Appointment of Assistant S.M.O."

J. F. CARR, Director of Education.

Education Offices, Town Hall, Hanley, Stoke-on-Trent.

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County Council of the West Riding
OF YORKSHIRE.

MIDDLETON-IN-WHARFEDALE SANATORIUM.

APPOINTMENT OF TEMPORARY RESIDENT MEDICAL OFFICER (B1).

Applications are invited from registered medical practitioners (Male or Female) for appointment to the position of Temporary Resident Medical Officer, at present vacant. Applicants should have held house appointments, and preference will be given to candidates having previous tuberculosis sanatorium experience. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £350, with the usual residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the County Medical Officer, County Hall, Wakefield, not later than the 5th November, 1941.

CHARLES McGRATH, Clerk of the County Council.

County Hall, Wakefield, October, 1941.

County Council of the West Riding
OF YORKSHIRE.

PUBLIC HEALTH DEPARTMENT—APPOINTMENTS OF MEDICAL STAFF.

THE COUNTY HOSPITAL, OTLEY. (296 Beds.)
TEMPORARY CONSULTANT VISITING SURGEON.

Applications are invited for the post of Consultant Visiting Surgeon (Temporary) to the Otley County Hospital. The person appointed would be required to make six regular attendances per week at the Hospital, and as required in emergency. He must be a Fellow of a Royal College of Surgeons and be prepared to reside within reasonable travelling distance of the Hospital. Salary £500 per annum.

Applications, stating age, qualifications, experience, and appointments held, should be addressed to the County Medical Officer, County Hall, Wakefield, not later than 10th November, 1941. There is no printed form of application.

THE COUNTY HOSPITAL, OTLEY. (296 Beds.)
STAINCLIFFE COUNTY HOSPITAL, DEWSBURY. (350 Beds.)
TEMPORARY JUNIOR RESIDENT MEDICAL OFFICERS.

Applications are invited from registered medical practitioners for the appointments of Junior Resident Medical Officers (B2), including R practitioners who now hold A posts when appointments will be limited to six months, otherwise they will be for a period of twelve months subject to one month's notice on either side. The salary is at the rate of £200 per annum, plus cost-of-living bonus and full residential emoluments.

Applications for the above appointments to be addressed to the County Medical Officer, County Hall, Wakefield, not later than 10th November, 1941.

CHARLES McGRATH, Clerk of the County Council.

County Hall, Wakefield.

Borough of Maidstone.

APPOINTMENT OF TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from registered medical practitioners for the temporary whole-time appointment of ASSISTANT MEDICAL OFFICER OF HEALTH. Preference will be given to Male applicants holding a registrable Diploma in Sanitary Science, Public Health, or State Medicine. The officer appointed will be employed on general duties in connexion with the work of the Health Department and School Medical Department and with Casualty Services, Civil Defence, under the direction of the Medical Officer of Health. The appointment is subject to one month's notice on either side. The salary will be at the rate of £500 per annum, rising by annual increments, subject to satisfactory service, of £25 to £700 per annum, with an allowance for the use of a motor-car of £40 per annum.

Further information may be obtained from the MEDICAL OFFICER OF HEALTH, 13, Tonbridge-road, Maidstone, to whom applications, together with copies of three recent testimonials, should be sent on or before 15th November, 1941.

King Edward VII Hospital, Windsor.

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification for the A posts and those holding A posts for the B2 post, for the appointments of HOUSE SURGEONS (A) and HOUSE PHYSICIAN (A) and SENIOR CASUALTY OFFICER (B2). The appointments will be for six months from the beginning of December. The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, together with copies of three recent testimonials, should be sent to the undersigned by 14th November, 1941.

GEORGE WESTON, Secretary.

King Edward VII Hospital, Windsor.

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification when appointment will be for a period of six months, for the appointment of a JUNIOR CASUALTY OFFICER (A). The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, together with copies of three recent testimonials, should be sent to the undersigned by 6th November, 1941.

GEORGE WESTON, Secretary.

County Borough of Newport.

PUBLIC ASSISTANCE COMMITTEE.

TEMPORARY SENIOR HOUSE SURGEON (B1).

Applications are invited from registered medical practitioners (Male) for the above appointment under the Hospital Scheme at WOOLOSTON HOUSE HOSPITAL (A1 Casualty Hospital). Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £350 per annum, plus the usual residential emoluments. All fees, with the exception of coroner's fees, are payable to the Public Assistance Committee. Appointment terminable by one month's notice on either side.

Applications, stating age, qualifications, and experience, and accompanied by copies of three recent testimonials, to be sent to the Public Assistance Officer, Town Hall, Newport, at once.

S. M. T. BURPITT, Town Clerk.

Town Hall, Newport, Mon, 25th October, 1941.

St. Bartholomew's Hospital,
ROCHESTER. (201 Beds.)

The Trustees invite applications for the post of HON. ASSISTANT RADIO-THERAPEUTIC SURGEON. Candidates must be registered under the Medical Acts, hold the Fellowship of the Royal College of Surgeons of England, Edinburgh, or Ireland, and undertake not to engage in general practice. The present Hospital Registrar is a candidate for the post.

Applications, and copies of testimonials, to be addressed to the SUPERINTENDENT-SECRETARY, and must reach the Hospital by 14th November, 1941. Canvassing is prohibited.

Great Barr Hospital,
BIRMINGHAM, 22.

APPOINTMENT OF A HOUSE SURGEON (A).

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a House Surgeon (A), now vacant, including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL SUPERINTENDENT.

Great Barr Park Colony, Birmingham, 22A,
20th October, 1941.

University of Bristol.

Applications are invited for the post of LECTURER IN PHARMACOLOGY. Salary £500–£600, according to qualifications and experience.

Applications should reach the undersigned (from whom further particulars may be obtained) as soon as possible, and not later than 8th November, 1941.

WINIFRED SHAPLAND, Secretary and Registrar.

21st October, 1941.

Locums and Assistants, also Ships
SURGEONS, required.—Write for particulars to A. SHAW, Medical Transfer Agency, Premier Buildings, 88, Church-street, Liverpool.

Wanted immediately, Outdoor Assist-
ant, Male or Female, in Town and Rural General Practice in Midlands. Three Partners. Salary £500, plus rooms. Car provided if necessary. Applicant must be efficient anæsthetist and have knowledge of general practice work.—Address, No. 825, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted, Dispenser-Secretary,
Somerset. Mixed general practice; two partners. Good salary. Write, stating age, &c.—Address, No. 827, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Lady Doctor required for Staff
Appointment with Nottingham firm; short hours.—Write for particulars to A. SHAW, Medical Transfer Agency, Premier Buildings, 88, Church-street, Liverpool.

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in St. Helens, Lancs. Panel Practice, 3000 units; gross income approximately £4000 per annum. Certified accounts. Good house, excellent position.—Write for particulars to A. SHAW, Medical Transfer Agency, Premier Buildings, 88, Church-street, Liverpool.

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INDUSTRIAL AND COUNTRY PRACTICES. Financial assistance for the purchase of practices can be arranged.—Send your requirements to A. SHAW, Medical Transfer Agency, Premier Buildings, 88, Church-street, Liverpool.

For Sale, Ross Microscope, Surgical
Instruments, including Aspirators, Catheters Eye Instruments, &c.—Address, No. 826, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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of excellent CONSULTING ROOMS are available for full and part-time use at moderate rents. Particulars on application.—ELGOOD & Co., 1, Bentinck Street, Welbeck Street, W.1. Welbeck 8974.

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